VETERINARY MEDICINE

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VOL. XXVIII

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If we fail to provide an adequate veterinary service for the country, then we must not blame the country if it looks elsewhere for such service.—*J. T. Share-Jones.*

Blood is a very interesting tissue; washed red blood cells are a valuable therapeutic agent in certain conditions and plasma from healthy animals may be toxic even for the same species of animals. Plasma from chickens affected with a certain form of cancer is capable of producing cancer in healthy chickens, and white blood cells from chickens affected with one type of cancer reproduces cancer when injected into healthy birds. Certain it is that care and judgment should be exercised in the use of blood or any portion of it as a therapeutic agent.

Staphylococcus aureus as an etiologic factor in ordinary suppurative processes such as abscesses is relatively common. Some types of the staphylococcus aureus are quite virulent, thus there have been extensive losses of young pheasants from acute staphylococcic septicemia and a subacute or chronic arthritis; a fatal staphylococcic, septicemic epizootic in rabbits appeared in the vicinity of Sao Paulo, Brazil; a very destructive type of bovine mastitis is associated with staphylococci infection; an occasional hog dies from staphylococcic septicemia.

David I. Macht, Baltimore, suggests the use of methylene blue in the treatment of stubborn skin disorders.

Smith and Siedell of the National Health Institute have obtained vitamine B in crystal form from an extract of Brewer's yeast. The crystals appear to be vitamine B in pure form. One fifteen-thousandth of a grain cured rats suffering from vitamine B deficiency.

Narcissus bulbs are said to contain a very poisonous substance and therefore discarded bulbs should not be fed to animals.

T. J. Glover and J. L. Engle, working at the National Health Institute, although not of the U. S. Public Health Service, have announced the discovery of a micro-organism that caused a typical cancer when injected into a guinea pig. Cancer authorities generally are skeptical.

Rocky Mountain spotted fever is transmitted to man by the bite of infected ticks. Several species of ticks are able to harbor the infection, but the two species responsible for the great majority of human cases are the *Dermacentor andersoni* or wood tick of the northwest, and the *Dermacentor variabilis* or common dog tick of the east. A vaccine has been prepared by the Public Health Service which is of value in the prevention of spotted fever.

The dairy cow is conceded to be the most efficient in the conversion of feeds into human food.

Pellagra rarely develops in families in which milk constitutes an important item of the diet.

The *Pasteurella boviseptica* is found in the upper air passage of about 15 per cent of normal cattle, according to Jorgenson. These organisms are not pathogenic under ordinary conditions. Recent experimental findings appear to corroborate former statements that hemorrhagic septicemia is most likely to occur in animals that have been subjected to unfavorable conditions such as improper feed and fatigue or chilling incident to shipping.

The cost of cattle production in 1884 was as follows: Grain fattened steers $4.00 to $5.00 per hundred. Grass and hay (semi-range) $3.00 per hundred. Strictly range steers, $1.50 to $2.00 per hundred. These prices applied to steers four to six years of age.

Two principal cost items, namely increased cost for pasture and delivery charge are more now (1933) than they were in 1884; otherwise the production cost of cattle is about the same as 50 years ago.

Goats are usually considered to be quite resistant to tubercle bacilli. Griffith inoculated two goats subcutaneously with avian tubercle bacilli. One of the inoculated goats produced five kids in three births and none of them showed any evidence of the disease; however, the mother of the five kids eliminated tubercle bacilli in her milk for five years after the inoculation. That the eliminated tubercle bacilli were virulent at the end of five years was evidenced by the fact that they produced fatal tuberculosis in fowls.—*Bio. Abs.* 3572.

There are almost nine million fewer horses and mules in the United States now than there were in 1920, which means that 40 million acres of land are no longer needed for growing feed.—*S. N. L.*, 23:635.

The hospital of the American Society for the Prevention of Cruelty to Animals handled 13,733 cases during the past year. Seventy-five percent of the cases were "charity cases." Twenty-five percent represented routine veterinary practice by an association supported by public contributions.

A mare belonging to a client of Willis Wilson, Dayton, Washington, recently foaled twins, one a mule, the other a horse. The most unusual feature of this case of superfetation is the long period that elapsed between breeding the mare to the jack and to the stallion. Twenty-nine days after the mare was bred to a jack, she was noted to be in estrum, and was bred to a stallion. At birth, neither colt was very strong and the legs were bowed, but the mule colt was much the larger of the two; the horse colt having the appearance of a premature foal. Both colts lived.

If 1% of the amount that has been spent in the name of farm relief had been used intelligently to teach the average farmer the obvious advantages of using horses and mules exclusively for power, there would be a sufficient number of these animals on our farms to consume the 10% surplus of agricultural products that now exists. The market for farm products is so sensitive that the elimination of this 10% surplus would at once raise the price of hogs $2.00 a hundred, cattle $2.00 a hundred, wheat 15 cents a bushel, corn 10 cents a bushel and dairy products at least 50%. Even then the prices of farm products would still be low but it would add nearly three billion dollars to the annual income of the American farmer—in Iowa $1,000 per farmer.—J. W. Boyt, in *The Des Moines Register*..

The great structure of modern medicine is built upon a foundation of animal experimentation.—Sir William Osler.

Much of our present-day knowledge of medical science is due to experiments upon dogs.—Simon Flexnor.

Progress in the treatment and control of diabetes is a direct result of experiments on dogs. The same is true of pernicious anemia. Only a few years ago a person suffering from this malady was doomed to death. Now he is given a reprieve. Sufferers from diabetes are made fairly comfortable and afforded many additional years of usefulness as a result of these experiments, which could never have been made if anti-vivisectionists had had their way.

There could be no urban life as we know it if animal experimentation had not been practiced in the past. Only through animal experimentation has it been possible to conquer the great plagues which a few centuries ago prevented the existence of large cities.

Studies made at the Wisconsin Experiment Station indicate that the vitamin D coming from a natural source such as codliver oil is materially more effective for poultry than that derived from irradiated ergosterol. The indications are that the vitamin D produced by ordinary irradiation of ergosterol is a different substance from that found in codliver oil.

A three-hour bath in tannic acid solution during which the burns become well tanned is a feature of the modern treatment of extensive burns, according to Donald B. Wells, Hartford, Connecticut. Following this, the burned tissue is removed as completely as possible and then the patient is sprayed for 72 hours with a solution of tannic acid, and during the whole time warm air is blown on him from an ordinary hair dryer.—*S. N. L.*, 23:636.

There are 696 hospitals representing 221,174 hospital beds and offering 6,261 internships, which are approved by the American Medical Association.

I. C. Hall has demonstrated the presence of *B. welchii* in the saliva of healthy humans. Such microorganisms are thought to be transient saprophytes and have no relation to the occurrence of pyorrhea or other infections of the mouth.

An occasional milk-borne epidemic of typhoid fever adds support to the demand for pasteurization. The future of the dairy industry is largely dependent upon increased milk consumption. Beyond question the safer milk is the pasteurized product providing the process of pasteurization has been efficient. An inefficient pasteurization gives a false sense of security, and if pasteurized milk is to be accepted by the public as safe and wholesome, health authorities must establish and maintain a standard of efficient pasteurization.

Transfusion of blood is an old practice. The results were uncertain until is was found that the blood from human beings could be divided into four different groups. Successful transfusion has been dependent upon using blood of the type or group from the same species of animal that corresponds to that of the patient. The transfusion of nonspecific blood frequently results in death. According to recent investigations the beneficial results of transfused blood are due to the red blood corpuscles and the plasma of the nonspecific blood contains the injurious substances. It was further demonstrated that washed red blood cells of one species of animal can be injected into another without danger. This will simplify transfusion and it also makes possible the preparation of red blood cells as therapeutic agents that can be provided without delay, however it is not advisable to recommend the use of red blood cells for transfusion until further evidence is available.

Agricultural Extension Service and Veterinary Practice

THE following is a summary of the case presented to the "Shannon Committee" by the A. V. M. A. Special Committee on Agricultural Extension:

Sworn testimony presented to "Shannon Committee" shows conclusively that the Extension Service of the U. S. Department of Agriculture in cooperation with the Agricultural Extension Service of the various states, is engaged extensively in business in many, probably most, of the states, to the very great injury of numerous citizens and taxpayers engaged in lines of business with which the activities of these Extension Services compete.

The most flagrant example of competition of the United States and state Agricultural Extension Services with private business is the activities of these Services in the sale of veterinary products—serums, vaccines, viruses and pharmaceutical products—for the prevention and treatment of disease in animals; and the attempted diagnosis and treatment of disease in animals by county agents, the local representatives of these services.

These abuses are widespread and extensive. In a single state (Illinois) it was shown that the sale of a single veterinary biologic (anti-hog cholera serum and virus) reached the enormous total of 49,000,000cc with a retail value of $350,000 in 1932. All of this vast amount of anti-hog cholera serum and virus, the latter being the actual cause of one of the most serious and costly diseases of farm animals, was used in that state either by county agents who are ignorant of pathology, and unqualified to use such products either efficiently or safely; or under their direction by farmers equally incapable of their proper use.

This invasion of the field of animal disease control by the governmental agencies has interfered materially, and in unnumbered instances disastrously, with veterinary practice.

The value of the service rendered to agriculture by the veterinary profession and its absolute necessity to the livestock industry is not generally appreciated. It was shown to the "Shannon Committee" by examples that the livestock industry of the United States as it is carried on today, is not possible without a good veterinary service. The vast interchange of pure-bred animals among the herds of the country for the purpose of improving the breeding, the extensive traffic in dairy cattle for replenishing the herds of milk producers, and the enormous shipment of cattle, sheep and swine from areas where they are bred to corn-belt areas for fattening, was shown to be impossible without a system of disease control such as only skilled veterinary service can provide. If veterinary practice must continue to compete with the very inferior service supplied at public expense by the Agricultural Extension Service, it will largely disappear and our livestock industry will have to go back to the methods of half a century ago and will suffer incalculable loss from disease and from restrictions laid upon its development by the threat of disease.

Further, the continued improvement of our livestock which is of prime importance to agriculture, is quite impossible without a highly efficient system of disease control such as only skilled veterinary service can provide. Without such veterinary service, our animal industry

would undoubtedly soon have to contend with many contagious diseases of livestock not now prevalent. Among such diseases may be enumerated: Contagious pleuro-pneumonia, rinderpest, foot-and-mouth disease, dourine, and European fowl pest. All the vast expenditures for the control of tick fever in cattle and tuberculosis in cattle and poultry stand a chance to be lost through a failure to continue these disease control projects to a successful conclusion or to maintain the advantages already gained if the veterinary service of the country, which has carried out these projects, be destroyed or seriously impaired.

The Agricultural Extension Service was built up in war time for the purpose of increasing agricultural production. It did not accomplish it and now that the need for increasing agricultural production has vanished, it has extended itself into the field of merchandising and of veterinary practice. The service is not needed by agriculture and should be discontinued. That it cannot supply a good veterinary service is admitted by everyone, including the head of the Extension service.

The Agricultural Extension Services are maintained cooperatively by Federal, state and county appropriations. The Federal appropriation, amounting to something over $10,000,000 annually, is matched dollar for dollar by state appropriations. The county appropriations amount to some $5,000,000 annually, making a total cost of this service to the taxpayers more than $25,000,000 a year. Maintained thus by government expense, it is invading and interfering in the field of veterinary practice, to an extent that it has already rendered such practice unprofitable in many localities and resulted in veterinarians located in such localities moving away or taking up other lines of work, thus depriving animal husbandry and agriculture of a service that is essential to its continued existence on its present plan of operation. In a single state it is shown that these services were directly responsible for 216 veterinarians quitting practice within the past three or four years. Public funds designed by the Congress for the benefit of agriculture are thus being diverted to a vicious, selfish purpose that harms agriculture and benefits no one but job holders.

Conclusive testimony was given to substantiate every statement in the foregoing summary of grievances of the veterinary profession against the Agricultural Extension Services, and further, it was shown that those services, operating through the county agents, are not qualified and cannot qualify to render a good veterinary service. Yet, because it is supported by public funds and is supplied free to the farmers, it is capable and actually is now undermining and destroying a good veterinary service that is essential to the farmers.

The Agricultural Extension Service which disburses $10,000,000 of Federal appropriations yearly, professes to have no control over county agents, whose salaries in part it pays, and to be unable to prevent them or other of its employes from engaging in veterinary practice, retail business, promoting farm organizations for the sole purpose of furnishing public jobs for themselves; in fact, practically no control over how the funds appropriated for it by the Congress are expended. The only practical remedy for the misuse of those funds is for the Congress to withhold them. There is no demand from the "dirt" farmers for these Agricultural Extension Services. The apparent demand is solely one nurtured by those engaged in farming the farmer and those profiting by the public jobs they make.

Specifically it was shown that county agents, who are not veterinarians, and who are not qualified to recognize diseases of animals, or to apply remedial measures, or to undertake measures for the prevention of spread of diseases they are unable to recognize and about which they know nothing, have been, and are now, engaging in veterinary practice for the treatment and prevention of serious diseases of livestock.

New Opportunities for Veterinarians

By H. J. MAGENS,
Huron, South Dakota

The conservation of wild life, mammals, birds, and fish and their culture for the enjoyment of sportsmen and tourists, is just emerging from the guess-work to the scientific stage. The wild life of many of the states is among the most important of their natural resources, of vast economic significance, and susceptible of great increases. After the destruction of feeding and breeding grounds and commercial slaughter, diseases and parasitisms rank first as destroyers of game. Veterinary medicine is essentially medical zoology and is indispensable to the successful control of these factors limiting the development of wild life. It should prepare for this new service.

IT IS NOT so long since it was taught that "no wild creature ever dies a natural death." The meaning was that creatures, *ferae naturae* did not die of old age, but that before reaching senility they fell victims to their natural enemies, or man, or succumbed to famine and exposure. Disease as a cause of death in wild mammals and wild birds just was not taken into account. It was thought to be associated only with domestication. Of recent years, our conception of the importance of infectious diseases and parasitisms as destroyers of wild life has undergone revolutionary changes. We now see periodical waves of tularemia sweep the rabbits from extensive areas as waves of hog cholera decimated the swine of counties and even whole states before the days of anti-hog cholera serum. We have seen hemorrhagic septicemia vie with famine as a threat to the buffalo in Yellowstone National Park. Ticks last winter killed more moose in Northern Minnesota than did hunters. We have found mountain sheep, inhabitants of the most inaccessible mountain fastnesses, dead of stomach worms. "Alkali disease," possibly botulinus intoxication, kills more wild duck in the northwest than the migratory bird law preserves and lead poisoning takes a toll of these birds elsewhere. Baudette examined fifty specimens of different species of wild birds in New Jersey and found all heavily parasitized.

FISH and wild game are among the most important natural resources of a number of states. Their economic value to those states is enormous. About seven million hunting licenses are sold annually in this country at prices ranging from $1.00 to $50.00; the majority at about $3.00 for resident licenses and about $20.00 for non-resident licenses. A much greater number of fishing licenses are sold at a lower price. The purchase of guns, ammunition, boats, fishing tackle, camp equipment, etc., supports a number of industries. The amount expended for meals and lodging, railroad fare and other forms of travel, guides, dogs, etc., is very large.

AS a measure for the relief of unemployment, the country has just launched a vast sylvicultural project. The "Reforestation Army" or "C. C. C. army" (Civilian Conservation Corps) now numbers 320 thousand. "Reforestation" is a misnomer as applied to it since far the greater part of its work will be in areas already forested. Their operations will in-

crease enormously the food, cover and shelter available for wild life and at the same time, decrease greatly the fire hazard. Clearing and thinning operations will let in the sunlight and increase food and shelter for wild mammals and birds. Dense stands of timber are notoriously deficient in wild life. Flood control will increase beyond measure the food and refuges for aquatic and amphibian species. The lessening of forest fires, one of the prime objects of the "C C C" will prevent the destruction of an incalculable amount of wild life and wild life food that has heretofore been lost annually. Conservation is emerging from the barber-shop and pool-room stage and about to enter a scientific stage of development.

OUR conservation procedures heretofore have been mostly of the trial and error kind. Year after year, farm raised pheasants have been sent into Northern, deep-snow wild land, to perish. Fish have been planted in strange waters almost without regard to temperature, food supply, enemies or places for reproduction. Not so long since a barber-shop biologist said to a pool-room naturalist that the grey ground lichens of Michigan's upper peninsula was just the same as the reindeer moss of Lappland and Alaska. The pool-room naturalist told a political conservationist official and presto! $50,000 of hunters' license money was spent to import a herd of reindeer. The reindeer died—mysteriously—so did large numbers of the native deer. More hunters' license money was spent to buy hay for these "starving" deer. When it was about over someone held an autopsy on one of the deer carcasses and then on others, then some of the weakest were killed for postmortem examination. The trouble was lungworm infestation. The idea of scientific management of wild life is just beginning to seep into public consciousness. It is not a new idea. Marco Polo reported its successful operation under the rule of the Great Kahn more than 600 years ago.

WITH an abundance of food and shelter provided, the amount of wild life is subject to but two limitations—commercial slaughter and disease. Natural predators and sportsmen may be disregarded. The former would be cared for by the same agency that supplied the opportunity for food and shelter and the latter would be easily overcome by nature's prolificacy. Commercial slaughter is a legal problem and has already been solved. Disease is a veterinary problem and the success of the scientific management of this enormously important natural resource of our country awaits its solution. Veterinary service will be as indispensable to "fericulture" when we have it as it already is to agriculture.

IN RECENT years I have received an ever-increasing number of calls to treat wild animals not only from various state and deputy game wardens, but also from ranches and farmers. More than anything else this reflects the decided change in public opinion towards the enactment and enforcement of protective game laws. The advantages that wild game have brought to rancher and farmer on one side the state and to the commonwealth and sportsmen on the other side are manifest.

Many ranchers and farmers have learned to their advantage that a wealth of game within their fence lines is productive of very substantial revenues. To be sure there are many instances where crops have been seriously damaged or even destroyed in small areas by deer, turkeys, pheasants, etc. Yet one must remember that it is just in these places that the revenues from hunting leases and sales of farm products to visitors have by far outweighed these losses. The low price of wool and mohair, and the fact that the large areas where sheep and Angora goats thrive are the natural habitat for various kinds of game have aided materially in bringing the health, wellbeing and increase of the game within their fence lines to the owners' attention.

IT BEHOOVES the veterinary practitioner to take advantage of this new trend of thought and to familiarize himself with these activities which are not only very interesting from a professional stand-

Right: Feeding the young faun.

Below: Before amputation of injured leg.

Right: Deer with leg amputated.

point but may be made very helpful in establishing the value of professional veterinary service amongst sportsmen, who include citizens of many classes and walks in life, most of whom heretofore have never had any opportunity of contact with veterinary service of any kind. They are keenly interested in these matters and will appreciate any help, which the veterinary adviser is in a position to offer to alleviate existing troubles among wild game.

Among laymen there is a widespread belief that diseases can be fought successfully only by employment of drugs. It is evident that medication must play only a minor rôle in the fight against diseases of game. A few selected drugs however are very useful within their limitations.

Of major importance in view of their economic aspects are of course epizootics involving our game animals; individuals rarely come to one's attention since the ailing animal always seeks cover. To combat properly epizootics of game animals and birds, we should be allowed, at all times regardless of closed seasons, to destroy diseased animals or those which may become carriers. We should endeavor to relentlessly destroy all carcasses of fallen animals by burning or otherwise, to render inaccessible sources of infection. Certain waterholes require draining and certain pastures may require fencing off. Effective fly control methods should be instituted. Segregation of sick game is advisable by systematically driving healthy individuals from such areas. Proper shelter and protection as well as feed should be provided for the remaining animals in the game area involved. Finally restocking with young vigorous previously immunized animals may be advised or some strong healthy males or as the case may be

pregnant females may be turned free in the area involved. Just what method is to be employed depends of course upon the disease or influence responsible for the loss of game.

THE decrease of game in a given area is in many instances believed to be caused by some epizootic. Careful study of the terrain and conditions therein often will show that disease is not primarily responsible but rather that disease is a sequel of other conditions, such as overstocking the area with domesticated animals; or an increase in predatory animals, wolves perhaps dogs gone wild; or due to the ravages of fires and floods or to drying up of waterholes and creeks caused by abnormal climatic conditions.

An increase of certain shrubs, plants or grasses which although prolific do not serve as proper feeds for game may also cause game to leave certain districts. One should keep in mind that dietary measures afford the greatest aid to deer in overcoming the after-effects of diseases of any nature. Diseased animals cannot survive on scant or coarse food that might suffice for the well animal. Their feed should be very nourishing, it should be appetizing, easily obtained, and easily assimilated. Diseased game animals need cover, even more than the well animals. This should be kept in mind when works of men or in some cases nature itself has destroyed this cover.

The difficulties encountered in keeping game out of infected districts is simplified by their acute sense of smell, their sharp eyesight and their suspicious character. Wires or lines with rags dipped into a dilute cresol solution of any kind hanging here and there will prove very effective in keeping them out.

OF THE many diseases of game the ones communicable to domesticated animals are of primary importance to the veterinarian since they may be transmitted to and from domestic animals, as is mostly the case, using the range. Important among them are anthrax, hemorrhagic septicemia, foot and mouth disease, tuberculosis under certain conditions, actinomycosis, foot rot and canker of goats and sheep, some forms of infectious stomatitis of the small ruminants, the mixed infection group of Angora goats manifested by keratitis and conjunctivitis, tendonitis, etc., and abortions, paratyphoid infections and finally rabies. Just how important a part brucellosis plays in this connection must be left to further research.

It is often difficult to determine whether the epizootic began with the game or the domestic animals. In most cases the game is not responsible but is unjustly blamed by the stockmen, in the hope of remuneration by the state. They often forget that they brought in some fine breeding ewes or nannies without benefit of a reasonable quarantine. They forget that they borrowed a billie or a fine buck from a nearby neighbor. Such seemingly unimportant happenings often clear up the case. Careful questioning will establish them.

OF IMPORTANCE to the rancher and the gamewardens as state representatives are also the many ecto- and endo-parasites common to deer, sheep and goats. They form a major problem, which cannot be discussed here for lack of space. Enzootic infestations of lungworms, stomachworms, tapeworms, liverflukes, gidworms, etc., are common amongst all small rumimants wild or domestic. Both share equally their propagation and distribution. Proper control measures such as changes of pasture, treatment of water, fencing off of infected areas or their drainage if possible, medication by feeding certain feeds all have certain alleviating values.

Of paramount importance is the interpretation of post-mortem findings and proper diagnosis. Laymen not familiar with examination of viscera are apt to blame for example a rather mild parasitic infestation for all sorts of things. As a rule significant postmortem findings will be overlooked completely or important pathological changes in the large glands or in the lungs under-

estimated. Here the veterinarian should assert himself with firmness.

TWO more phases of this work not less interesting call for veterinary advice. Law enforcement is one of them. Obviously the establishment of anatomical and other structural facts of the animal body in order to establish its sex must be a purely veterinary matter. The possession of carcasses or parts of carcasses of females may be illegal under existing game laws. We have been entrusted with several cases of this kind. Our affidavits led invariably to settlement out of court resulting in a number of instances in heavy fines to individuals and in very substantial fees from the state department for professional services.

Another phase of this work is in connection with breeding and rearing of game for restocking ranges. It surprises one how little there is to be found in our veterinary literature concerning these matters. Animals to be used in areas formerly infected were given prophylactic treatments of various types. This method proved highly satisfactory. This work is very interesting, it calls for ingenuity, resourcefulness, excellent judgment and keen observation. It's success depends entirely upon close cooperation with the laymen entrusted with the care of these young. Harmonious understanding by all parties involved is essential. The financial aspects were satisfactory, but of greater gratification was the knowledge of having aided materially in the furtherance of a worthy program for the benefit of all.

A FIFTY-POUND MEAL

A hippopotamus in the Milwaukee Zoo is fed once a day, at 4:00 P. M.; the ration consists of:

Chopped alfalfa hay	25 lbs.
Carrots	2 lbs.
Beets	5 lbs.
Onions	2 lbs.
Bran bread	15 lbs.
Bran	1 lb.
Apples	2 lbs.
Bananas	½ lb.

ESTRUM IN THE BITCH

According to Whitney, the mating cycle of the bitch may be divided into four periods.

1. Beginning congestion of the reproduction organs.
2. Bloody discharge from genital organs —an average of 11 days.
3. Copulative desire—an average of seven days.
4. Genital organs returning to normal.

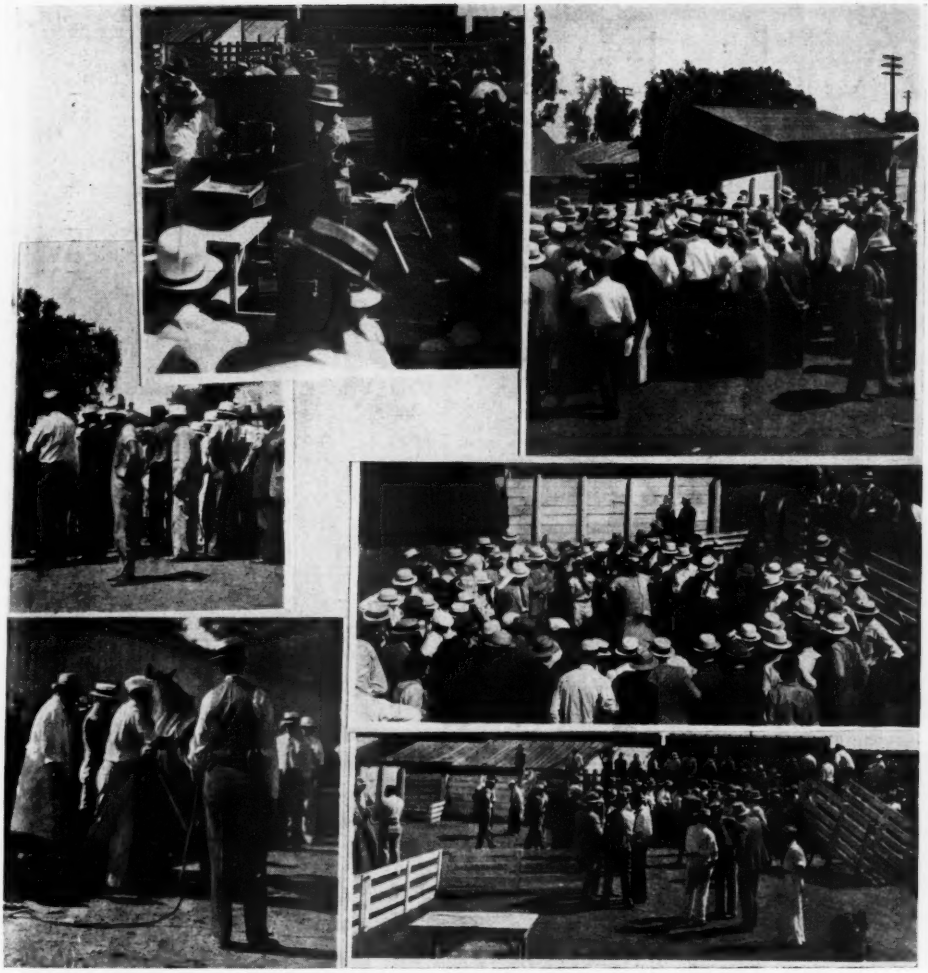
Whitney believes that ovulation occurs on the fourth to the fifth day of the copulative period. He also found that sperm cells had reached the ovaries at the end of an 18-minute copulation period. No motile sperms were found two and one-half days after copulation. The usual mating season in our climate is April. Bitches of the larger breeds usually have the largest litters. The sex ratio in 49,650 dogs tabulated was males 106 to females 100.—*Bio. Abst.* 3144.

IRREGULAR BREEDING

According to a summary of one volume of Produce Register of the American Hereford Cattle Breeders Association 6,375 cows produced 31,560 calves, an average of approximately five calves each. The following detailed data are interesting:

1400 cows produced one calf each.
820 cows produced two calves each.
557 cows produced three calves each.
468 cows produced four calves each.

or 3,246 cows produced 6,584 calves and the other 3,129 cows produced 24,976 calves. That is 50.83 per cent of the cows produced 20.86 per cent of calves and 49.17 per cent of cows produced 79.14 per cent of calves. It would be interesting to know whether the low production cows were largely confined to the same herds or were rather evenly distributed through all of the herds. It is certain that the production of only two calves for the entire breeding period of a cow is unprofitable. This loss is in the main referable to preventable breeding diseases and improper breeding hygiene.



Third Annual Clinic, Eastern Iowa Veterinary Association, Mechanicsville, Iowa, June 15, 1933. Left to right: Top (1) F. M. Wilson, Mechanicsville, placing a frozen fetus in an apparatus, a sort of artificial uterus to demonstrate the use of the fetotome through a sort of home-made vagina. (2) Chairman Jas. C. Carey, West Liberty, of the Cattle Section, operating on a bull for nasal tumor. Center: (3) C. E. Juhl, Osage, performing cesarean section on a cow. (4) Examination of a dental case in a horse. Bottom: (5) C. H. Waite, Stanwood, directing the casting of a cryptorchid for castration. (6) Chairman W. L. Andrews, Milton, of the Sheep Section, and H. W. Conners, Bloomfield, starting demonstrations on sheep.

A bright, cool June day brought veterinarians from six states, Iowa, Illinois, Minnesota, Missouri, Nebraska and Kansas. Many of them, accompanied by their wives, to see the operations and demonstrations at this justly famous clinic. Two-hundred sixty paid the registration fee ($1.00), and lunch was served to more than 300. Dean Stange and Profs. Bergman, Fowler, Lee and Hewitt from the State College attended as did H. A. Seidell, the new State Veterinarian; J. A. Barger, Inspector in Charge of Bovine Tuberculosis Eradication, and other prominent veterinarians from over the state. There was a superfluity of clinic material and a half dozen or more operations and demonstrations were carried on concurrently throughout the day. The ilustrations indicate the great interest taken in these clinical demonstrations by those in attendance.—Photographs by Grant B. Munger.

Amebic Enteritis in Swine

By A. T. KINSLEY,
Kansas City, Mo.

ENTERIC disorders in swine are quite prevalent and because of the numerous causes, and variable lesions, these disorders are frequently difficult of diagnosis and control. Although enteritis in swine may be induced by chemical irritants, the majority of cases are caused by bacteria and animal parasites. Thus, infectious necrotic enteritis is primarily caused by the *B. suipestifer*. Dysentery is associated with pleomorphic streptococci. The *Erysipelitis rhusiopalthiae* (B. erysipelas suis) not infrequently produces a marked enteris. One type of enteritis is caused by microscopic worms. Coccidiosis is manifested by an acute enteritis, trichomonas and ameba may be causative factors of enteritis. An occasional outbreak of an acute enteritis is associated with myriads of ameba and the apparent absence of other known pathogens either bacterial or protozoan. According to literature ameba and particularly the *Balantinum coli* are not pathogenic. It is true that ameba in limited numbers are found frequently in the intestinal content of swine and in such cases they are apparently saprophytic. It is possible that ameba may become pathogens as is noted in some other microscopic forms of life and is it not possible that there are ameba that are pathogenic for swine? The following is a brief description of a condition in swine in which there is a marked enteritis, accompanied by myriads of ameba in and upon the affected mucosa. No other causative factors have been demonstrated.

History—In the beginning usually only a few animals are affected. Within a week or ten days, there are usually several animals affected. In outbreaks in which recently purchased animals carry the parasites, they become affected about ten days prior to the native swine. This indicates the period of incubation is about ten days.

Symptoms—The symtoms manifested, no doubt, depend upon the relative degree of infestation. In the usual outbreak the affected animals are gaunt; the appetite impaired; the temperature up to 106 or 107 deg. F.; thumping is relatively common; there is a profuse diarrhea, and the affected animal becomes weak and the gait wabbly. Death may ensue in 24 to 48 hours. The mortality is relatively high.

Lesions—The primary lesion of ameba enteritis is an acute inflammation involving the intestinal mucosa. The affected mucosa is covered with a rather loosely adhering exudate. The exudate has the appearance of clabbered milk and when removed the underlying tissue appears scarlet red. Microscopic examination of scrapings made from the affected mucosa after the exudate has been removed reveal myriads of ameba, providing the examination is made from fresh specimens.

Diagnosis—The diagnosis of ameba enteritis involves a knowledge of other enteric disorders. Infectious necrotic enteritis is characterized by a diphtheretic inflammation primarily involving the large intestine. Enteritis associated with swine erysipelas involves the stomach and more particularly the small intestine, the involved mucosa being intensely red. Pig dysentery is characterized by an acute hemorrhagic inflammation, the affected portion of the intestine being brick red in color and there is no accumulated exudate. Coccidiosis is characterized in the beginning by a flaky like deposit on the mucosa, later the intestinal mucosa becomes thickened. There may be sloughing or variable sized areas of the mucosa and hemorrhages as a result of the slouch. Amebic enteritis is characterized by the clabbered milk like exudate; a temperature usually higher than the temperature in cases of infectious necrotic enteritis, dys-

entery and coccidiosis, and the stomach is not involved as it is in erysipelas.

Because of complications it may be necessary to subject specimens to laboratory tests for an accurate diagnosis.

Treatment—Because of the fact that the apparent causative factor, the ameba, is found in large numbers beneath the exudate, they are protected against medicinal agents. Dr. H. J. Hearrington, of Lexington, Mo., reports good results in the treating of swine affected with amebic enteritis, provided the treatment is started early, with the following:

Copper Sulphate	2 oz.
Bicholoride of Mercury	2 oz.
Iron Chloride	2 oz.
Water	1 gal.

Use one tablespoonful of the stock solution to each gallon of drinking water or water for soaking feed. Add to the above one ounce of copper sulphate when coccidia are present.

From field investigations it has been found that complications, both pulmonary and enteric, are apparently responsible for the high death loss. In order that the complications may be diminished, the use of a bacterin containing the usual causative factors of the complications such as *B. suipestifer,* streptococci and diphtheroids is advisable.

RELATIVE PRODUCTION OF DIGESTIBLE NUTRIENTS

It takes 81 bushels of oats or 48 bushels of barley or 38 bushels of wheat per acre to supply as much total digestible nutrients as is supplied in 40 bushels of corn.

The average yields of corn, oats, wheat, and barley per acre in the United States for the period 1914-1920 were 27 bushels of corn, 33.4 bushels of oats, 14.6 bushels of wheat, and 25.4 bushels of barley. When these yields are converted to total digestible nutrients we have 1,235 lbs. for corn, 752 lbs. for oats, 701 lbs. for wheat, and 968 lbs. for barley.

There are 45.75 lbs. total digestible nutrients in a bushel of corn and only 22.52 lbs. in a bushel of oats.

Two investigations, one at the Carnegie Institute, the other at Johns Hopkins University, have reported that one form of cancer in chickens is a mass of white blood cells that have deviated from their normal function. This type of cancer can be transmitted by plasma or white blood cells from an affected to a healthy chicken.

Hoard's Dairy Digest

There are more registered Jerseys in Tennessee than the total of all registered Holsteins, Guernseys, Ayrshires, Brown Swiss, and all breeds of registered sheep, swine, beef, horses.

Workers in Uncle Sam's Bureau of Dairy Industry have found that butter from cows fed No. 1 alfalfa is much yellower than that from cows fed No. 3 timothy, and that it contains 5 times as much vitamin A.

By action of the New Hampshire legislature, Cow Island, in Lake Winnipesaukee, has been rechristened Guernsey Island. Though deserted now, the Island was the home of the first Guernseys brought to America.

William B. Duryee, New Jersey Secretary of Agriculture, has announced his endorsement of the proposed legislation requiring that milk and cream sold in New Jersey be produced only by tuberculosis-free cows.

Pennsylvania with a total of 828 herds certified as Bangs disease-free on January 1, 1933, headed the list of states in number of such herds. Adopted in 1921, the Pennsylvania plan has been followed in 32 states and several foreign countries.

A popular belief that foam on separator skimmilk is harmful when fed to calves has been exploded by trials at the South Dakota Station. Skimmilk and foam should be fed in definite, weighed amounts. Overfeeding, rather than the foam, is believed to be the cause of trouble.

Gonad Transplantation

Certain selected cases of sterility in animals respond readily to transplantation of grafts from sex glands of normal animals. The operation is a simple one and has a place in veterinary practive.

By DEETS PICKETT,
Manhattan, Kansas

IT HAS long been known that the sex glands are in some mysterious manner responsible for the development of masculine or feminine characteristics. It was observed that after castration both male and female assume a similarity to the opposite sex morphologically, physiologically, and psychologically. In reality, according to various authorities, they tend more or less toward a juvenile form common to both sexes. It was not till comparatively recent years that the influence of sexual glands was ascribed to their internal secretions.

The first experiment in the transplantation of sex glands was made by John Hunter on a fowl in 1762. Berthold (1849) performed similar experiments. He removed the testicles of several birds. In one he replaced the testicles in the abdominal cavity (auto-transplantation). In the abdomen of a second bird he placed the testicles of another bird (Homo-transplantation). The appearance of the birds remained that of normal cocks. Later, when the engrafted testicles were removed from one of the birds he became like a capon. In those days nobody seemed to take any interest in the matter and Berthold's experiments were forgotten. New and careful experiments were made by Pezard (1911, 1918). After having completely removed the testicles from birds five months of age, the organs were cut into pieces and replaced in the abdomen. At first there were signs of castration; a regression of the comb began, sexual instincts and crowing did not develop, though already manifested by the control animal; but about a month after the operation, the experimental birds were normal in regard to head appearance and sexual behavior. Pezard continued his observation for about two months longer without observing any abnormality in his animals. He attributed his results to internal secretion produced by the testicles.

According to Lipschutz, the Chicago surgeon Lespinasse, was the first to perform a successful testicular transplantation in man. Pieces of testicle were implanted on the muscular recti of a man who lost both testicles in an accident. Sexual capacity was regained, and persisted many months during which the patient was under medical observation.

Lichtenstein (1916) successfully transplanted the testicles obtained from a forty-year-old man to the obliquus externus muscle of a soldier who lost both testicles from a wound received in the war. Lichtenstein relates that, about the second week after the operation, signs of a regained sexual desire and capacity were experienced. The first normal sexual act was performed about six weeks after the operation. The accumulation of fat decreased and the beard began to grow. Four years after the transplantation the man was still sexually normal.

Many testicular transplantations performed during recent years have been successful, whereas others have had no effect, the graft degenerating sooner or later. A great number of successful testicular grafts were made from ape to man by Voronoff (1923-24) and Thorek (1923). The observations of these authors leave no doubt that a testicular graft from certain anthropoids can survive in the human body for several months, and possibly even for years, exhibiting a normal hormonic capacity.

Harms (1923) transplanted testicles of young animals into senile rams ten or twelve years of age. Various indications of senility, such as thin wool, cachexia, apathy, and tremor partly disappeared, and one animal, which was said to have been sterile for two years, once more bred. He observed his animals for more than four years. Removal of the grafts caused a reappearance of the signs of senility. It must be remembered however, that senility is not caused merely by the dysfunction of one organ or one group of organs. According to Lipchutz, rejuvenation induced by an improvement of the functional capacity of a certain organ, can be only a partial or restricted rejuvenation. However, there is no doubt that symptoms of senility may be checked to a certain degree, and a limited rejuvenation may take place under the influence of sex hormones; the effects lasting for some time.

A great number of ovarian transplantations have been made in the lower mammals during the past twenty-five years. They seem to be more successful than do testicular transplantations.

Ribbert (1898) was the first to make detailed observations concerning ovarian transplantations. After transplantation in the rabbit, the greater follicles and corpora lutea were found to undergo degeneration; "reparation" takes place by follicular development of the smaller follicles, which hitherto remained intact. According to Marshal and Jolly (1910), all the follicles may undergo atresia in the ovarian graft of the rat. In some cases the graft consisted almost entirely of lutein cells. They stated also (1907) that in the rat the transplanted ovary can undergo cyclical changes like the normal ovary. They found in the graft at the commencement of the breeding season large follicles, and afterward they found also corpora lutea. Evidently ovulation can take place in the transplanted ovary. According to all authors who have made histological observations on the ovarian graft, the difference between a normal ovary and an ovarian graft seems to be merely that there is an accelerated atresia of those follicles which are already of a certain size at the time the transplantation is performed. A predominance of, or a hypertrophy of interstitial tissue consisting of epitheloid or lutein cells occurs in ovarian transplants. From this hypertrophy of interstitial cells, an intensified internal secretion results. The uterus has been found to be more developed in the animal with ovarian transplantation than in the normal animal.

CITING two cases at the Kansas State College Veterinary Clinic: A three-year-old, wire-haired, female, fox terrier was presented on February 18, 1933. The history was that she had failed to come in heat since her last heat period in November of 1930, at which time she was supposed to have been suffering from distemper.

A general examination revealed that the dog was apparently healthy in every way with the exception of the failure of the estral cycle.

Ovarian extract, 5cc, was administered subcutaneously in the region of the neck. The owner was furnished with a number of aphrodisiac tablets with the direction to give one every day for twelve days. He was then advised to take her home and bring her back at a later date.

She was again brought into the clinic on March 4. She had not as yet shown signs of estrum. After making a genital examination, it was decided to attempt ovarian tissue transplantation.

An adult collie was spayed and the ovaries placed in a warm physiological saline which was in waiting. Immediately following this operation, the wire-haired bitch was confined in a recumbent position. A site immediately above the jugular furrow, midway between the shoulder and the point of the mandible, was chosen for implantation. This area was shaved, and disinfected with a 1 to 1,000 solution of alcoholic mercury bichloride, and anesthetized with a 2%

procaine solution, injected hypodermically. A longitudinal incision about an inch long was made through the skin and into the sterno-mandibularis muscle, approximately one-half inch. A section one-eighth inch thick taken from the middle of the ovary was inserted in the muscular opening. The wound in the skin was sutured with chromic catgut.

She was returned on March 23, showing definite signs of estrum, including menorrhagia. On palpation the ovarian tissue could be felt as a bean shaped nodule. She was bred on March 25.

A VALUABLE greyhound bitch was brought to the clinic April 10, 1933. She was three years old and had never come in heat. She was found to be apparently normal with this exception. The mother of this dog had shown the same symptoms until about five years of age. An ovarian tissue transplantation was performed, similar to that in the terrier. She came in heat April 28, and was subsequently bred.

Conclusions: There is no reason why transplantation of sex glands should not be resorted to in veterinary medicine in the treating of certain types of sterility. Although it will not benefit all cases, it will undoubtedly prove of value in many. It may offer also exceptional opportunity for treating senility in animals kept for breeding purposes, or for those having a high sentimental value.

RABIES IN ILLINOIS

The Illinois Department of Public Health has distributed material enough to treat an average of 20 people per week during the last two months. Up to June 1 of this year treatment for 600 people had been distributed and 405 heads had been examined in the laboratories of the department. The state health department supplies Pasteur treatments only for those unable to pay for them; so 600 treatments for the first five months of the year by no means includes all the treatments given in the state.

INCUBATOR FUMIGATION

Eggs for hatching are not injured by repeated formaldehyde fumigation (40cc of formalin to 100 cubic feet of incubator space). Incubators should be fumigated at the start of the hatching and again 24 hours before the hatch. When one-tenth to one-fifth of the eggs are hatched the incubator should be fumigated again, using 20cc of formalin to 100 cubic feet of incubator space immediately after which the chicks should be removed from the incubator. A fourth fumigation (20cc per 100 cu. ft.) should be given when the hatching is complete. Chicks more than 24 hours old should not be subjected to formaldehyde fumigation. Each fumigation requires 3 hours.—Robt. Graham.

SALT AS A PREVENTIVE OF FATIGUE

Some Italian military surgeons investigated the advisability of giving salt in the form of mildly salt water to troops starting out on long marches and to athletes who are to engage in endurance contests. The soldiers under observation marched ten to twelve miles a day. The athletes were runners, participating in races of from ⅔ of a mile to about 4 miles.

The amount given was about thirty grains. The time was three-quarters of an hour before the start of the race or the beginning of the march. The method was to dissolve the salt in enough water to give it a very faint salty taste. The water was made cool and appealing. It was found that the men who drank this salt water lost less weight, sweat less, and had more endurance than those who had not taken it.

It has been found that overheat among stokers is due not so much to the high temperature as to an unbalance of the calcium sodium and phosphorus in the blood. Excessive sweating by carrying away a large amount of sodium chloride brought about this unbalance. The treatment consists of clysters and even intravenous injections of salt water.

LOUPING ILL AND TICK BORNE FEVER OF SHEEP

Some three years ago, veterinarians at the Moredun Research Institute, Edinburgh, undertook an investigation of "louping ill," a disease of sheep that has caused a material loss in flocks in Scotland for many years, and one that had previously been the subject of scientific investigation. The field and laboratory work was carried out by J. MacLeod and W. S. Gordon under the direction of J. Russell Greig, Director of the Institute.

The investigation revealed that what has been termed louping ill is in reality two diseases; both caused by infection carried by ticks, *Ixodes ricinus,* and occurring often simultaneously, but distinct and conferring no cross immunity. The investigators term the newly recognized disease "tick borne fever." Concerning it, they say in *Parasitology:*

"In the course of an investigation into the transmission of louping ill, it became apparent that the tick, *Ixodes ricinus,* was capable of causing a febrile condition in sheep. This condition was found to be due to an infective agent which could be passed from sheep to sheep in series. The disease so produced was shown to be clinically and immunologically distinct from louping ill, and was named tick borne fever. We have already shown that the same tick is the vector of louping ill (MacLeod and Gordon, 1932).

"Although the mortality directly resulting from tick borne fever is relatively low, the disease is nevertheless of considerable economic importance. It is well known that in certain districts many sheep fail to thrive in the spring, even after there is a good growth of grass. The only clinical symptoms of illness in such sheep are dullness and loss of bodily weight. Lambs especially are said to pass through a period of unthriftiness after they are about three weeks old. Since this type of case occurs during the louping ill season and is associated with the presence of ticks on the sheep, the farmer naturally attributes it to a mild infection with louping ill. It is probable that many of these cases of so-called mild louping ill are actually cases of tick borne fever.

"During this period on tick-infested farms it is common for a number of the sheep to die from undetermined causes, and it is possible that such deaths result from a primary infection with tick borne fever followed by some secondary infection. Our experimental evidence (MacLeod and Gordon, 1932) shows that tick borne fever aggravates the harmful effects of louping ill infection, and it is probable that it may predispose sheep to other secondary infections, especially since it has a debilitating effect on the affected animal. It is, therefore, possible that the spring mortality which occurs among the flocks on at least some tick-infested farms may be due in many instances to secondary infections, the common predisposing cause being a primary tick borne fever infection.

"*Summary:* 1. The causal agent of tick borne fever is transmitted by the adult female and the nymphal stage of the tick *Ixodes ricinus.* Two female ticks are sufficient to produce infection in a sheep. The larval stage does not appear to be infective. In a limited number of experiments the disease has not been produced in sheep by the inoculation of emulsions of presumably infective ticks.

"2. The disease as produced by tick infestation is characterized by a period of incubation which varies from 3 to 13 days, after which there is a shap rise in temperature; a "plateau" type of febrile reaction follows which lasts from 6 to 22 days, the temperature gradually subsiding to normal. Affected animals usually recover. Mortality as a direct result of infection is rare, but there is evidence to suggest that tick borne fever may predispose affected animals to death from secondary causes.

"3. The blood of a sheep which has reacted to the disease remains infective for some time after the subsidence of the thermal reaction.

"4. The goat is susceptible to tick borne fever."

ANGIO-NEUROTIC EDEMA IN A DOG

Subject—A fourteen-month-old female Chow.

History—This animal had been in my care and under my supervision since September, 1932. It had been suffering from mild cases of gastritis at frequent intervals, from which it made uneventful recoveries. Listlessness and constipation were constant complaints.

Symptoms—On February 1, 1932, I was called to see this bitch and she had a swelling on her lips. In a short while her eyes became swollen, completely obliterating vision. These two swellings fused and caused great disfiguration of the face. Dyspnea and ptyalism were marked. The temperature was normal, and the pulse 140. Careful examination revealed these swellings to be soft and circumscribed, with no indication of inflammation. There was no pitting on pressure. Examination of the oral cavity revealed no diseased condition of the teeth, but the pharynx and glottis were considerably swollen. There was a recovery, but with recurrences at about two week intervals.

Diagnosis—Angio-neurotic edema. It may be worthy of note that this disease is also known as giant urticaria and Quincke's disease, or Quincke's edema.

Etiology—It is my opinion that this is an allergic protein hypersensitivity causing an increased permeability of the capillaries with exudation of serum into the subcutaneous tissues. I may state at this time that the animal during its attacks of gastritis vomited only certain foods such as carrots, beets and other varieties of tubers.

Treatment—The first and second attacks were treated with subcutaneous injections of adrenalin and hot fomentations were applied to the parts. This is the usual treatment for these cases, but the attacks recurred, nevertheless. Finding that a vaso-constrictor did not have the desired action, I decided to reverse the treatment and use a vaso-dilator in the form of histamine phosphate, a product of Parke Davis & Co. This preparation is put up in one cubic centimeter ampules, each ampule containing histamine phosphate in 1/1000 solution.

I started treatment by giving an intramuscular injection at weekly intervals, starting with three minims of the solution and increasing the dose by two minims until one cubic centimeter had been reached. At this point marked dyspnea resulted. I reduced the dose to twelve minims and continued this dosage until twelve ampules had been used. This treatment was supplemented by calcium gluconate tablets twice daily. The tubers were eliminated from the diet.

The result of this treatment was most gratifying. The animal has had no recurrence from the onset of the treatment, and she has been very lively with no further attacks of gastritis, and no more listlessness.

Histamine (beta-iminazolyl-ethylamine) is derived from the amino-acids of protein by the process of decarboxylization (loss of carbon dioxide). To justify my selection of this drug, in this case, I take the liberty of tabulating a few of its major actions:

(a) Vaso-dilatation.

(b) Increases flow of pancreatic juice.

(c) Increases flow of intestinal secretions.

(d) Causes contractions of musculature of intestines and uterus.

(e) Excites contractions of the bronchi.

There is occasionally a secondary reaction from histamine manifested by a temporary increase in the pulse rate and marked dyspnea. If this circulatory depression becomes marked, it may be controled readily with a subcutaneous injection of one cubic centimeter of adrenalin chloride solution, 1:1000.

Histamine should not be used on pregnant bitches because of its uterine action.

It is interesting to note that in William Osler's "System of Medicine" he recommends the use of nitro-glycerin in the treatment of angio-neurotic edema. This is also a vaso-dilator and, therefore, theoretically should be contra-indicated along with histamine phosphate.

Possibly my use of a different vasodilator may account for the success of the treatment in this particular case.

Martin D. Baum,

New York, N. Y.

CHAMPION DAIRY COW

Femco Johanna Bess Fayne, bred and owned at Femco Farms, near Breckenridge, Minnesota is the new champion butter producing cow of the world. The animal recently completed an official record of 1,510 pounds of butter and 33,649 of milk in 365 days and becomes one of the five cows in dairy history to produce over 1,500 pounds of butter. Three of the other four also made their records in Minnesota.

HUMAN AND BOVINE TUBERCULOSIS IN ENGLAND AND WALES

In a study of all the available information on bovines sent to abattoirs, including those suspected of tuberculosis, it was found that 39.5% contained gross macroscopic lesions of tuberculosis. It is estimated that on the basis of tuberculin reaction (1) at least 40% of the cows in Great Britain are infected with the tubercle bacillus, though only a minority of them are in an infective condition; (2) about 0.2% of all cows are suffering from tuberculosis of the udder, and are therefore probably excreting living tubercle bacilli in the milk; (3) about 40% of the cows slaughtered in the public abattoirs show naked-eye lesions of tuberculosis; and (4) a proportion of the raw market milk, varying in different parts of the country from 2 to 13%, with an average figure of 6.7%, contains living tubercle bacilli. It is also estimated that (1) about 6% of all deaths from tuberculosis are caused by the bovine type of bacillus; (2) about 2,000 deaths, mostly in children, occur annually from this cause; (3) at least 4,000 fresh cases of bovine infection develop each year; and (4) an immense amount of suffering, invalidity, and often deformity is caused by this bacillus. —*Exp. Sta. Rec.* 68:3:379.

MILK CONTROL

Milk is in universal use as a food. It is peculiarly liable to contamination and adulteration. Therefore, in the interest of public health and safety, the regulation of its production, marketing, and sale are held to be within the proper exercise of the police power of the State. This the State may effectuate directly by its statute, or it may delegate its regulatory power to an official board or officer, or to a municipality.

This power may be either exercised or delegated directly or completely. The State may determine the standard of quality, prohibit the production, sale, or distribution of milk not within the standard, divide it into classes, and regulate the manner of their use, so long as these standards, classes, and regulatory provisions be neither unreasonable nor oppressive. The many recorded instances in which the courts have sustained this power of regulation bear witness to the liberality of their viewpoint where the public health and safety are concerned.—Chief Justice A. J. Tobey, Connecticut, in a decision quoted in *Public Health Reports* 47:49:2250.

PRESCRIPTION FOR ACARI

Henry Gray, in the *Veterinary Record*, recommends the following prescription for the treatment of ear mites in dogs, cats, rabbits and other animals:

Iodine (crys.) 1
Phenol (crys.) 3
Glycerin (c. p.) 60

Heat must be applied to dissolve the iodine completely.

The preparation has not only an astringent, but a sedative action and is disinfecting and disinfesting. It will kill parasites exposed to its effects in one minute. About three applications at three to four-day intervals are sufficient. The author states:

"Long experience has taught me never to wash the external auditory cavity but to loosen the dirt or other material by manipulating the base of the ear between the thumb and forefinger a few times after

pouring in a sufficient amount of the liniment to reach the tympanum. The flap of the ear is held a few minutes so that the animal—whether dog, cat, ferret, polecate (fitch), or rabbit—cannot shake it out. If there is a large collection of *debris* it can be scooped out by means of the loop end of a hairpin."

A SAFE AND EFFECTIVE TREATMENT FOR FILARIASIS IN DOGS

Two years ago, a part-bred setter was brought to the office suffering from ascites. Ten quarts of fluid was drawn from the abdominal cavity. Microscopic examination of the blood revealed the larvae of *Dirofilaria immitis.*

The treatment consisted of arsenic trioxide, one grain and a level teaspoonful of powdered areca-nut daily. The case did not return for further treatment.

Eight months later, the same client brought another, a somewhat smaller dog (fox terrier-hound cross) suffering with the type of dyspnea which often characterizes filaria infested cases. The microscope revealed the larvae in the blood. Upon being told that the dog had heart worms, the owner said: "The other dog recovered in a week after treatment was started." He was asked to bring the first dog to the office for a blood examination for which there would be no charge.

The same treatment was given the smaller dog, and was followed by favorable results according to the owner. This case was not returned for treatment.

The first case (the grade setter) was brought in for blood examination a few days later. The findings were negative. The animal was fat and appeared to be in the best of health.

Since that time, I have treated a number of cases of filariasis in the same manner with consistently satisfactory results. All of the cases treated showed much distress and marked clinical evidence of the disease at the time they were brought to me. All showed a passive laryngitis and larvae in the blood. All were farmers' dogs and came from miles away in the country and on this account were not returned for blood examination after they were apparently cured. However, to ascertain their condition, a number of cases were visited by the writer a few weeks or months after they were treated. Two were found to be showing symptoms of the ailment again; one case two months after treatment and another six months after treatment. Whether the recovery in each of these cases was only partial and their present condition represented a relapse or whether the recovery was, as the owner thought, complete and the dogs were suffering from a reinfestation, I was unable to determine.

Whether the beneficial results should be credited to the arsenic or to the areca-nut, or both, I do not know. The arsenic trioxide tablet should be given crushed over the food and not on an empty stomach, to avoid the local effect of the drug. The areca-nut on the other hand, should be given on an empty stomach, at least an hour before feeding, to avoid vomition. The course of treatment consists of about two dozen arsenic trioxide tablets and an ounce of areca-nut. Treatment, however, should be continued as long as larvae are found in the blood.

The dosage should, of course, vary with the size of the dog. If there is a marked reaction after giving the aneca-nut, give less the next time. If given in too large a dose, arsenic sometimes causes vomiting.

Owing to the comparatively few cases on which to base conclusions, we should not be too optimistic over the results; since it is claimed by some that spontaneous cures are not unknown. Furthermore, according to others, the larvae are not always found in the blood in infested subjects.

With his enthusiasm tempered by the foregoing statements, the writer is pleased to offer this report at this time rather than wait the long period necessary to reach definite conclusions.

F. G. Steinbach,

Wildwood Crest, N. J.

HANDLING AND CONTROL OF THE DOG

No.1. In carrying a dog grasp the neck with one hand and the sternum with the other. This is the safe handy way to carry a dog unless he has broken ribs.

No. 2. The safe, easy way to hold a dog when giving a hypodermic or examining a wound. Have your assistant grasp the neck with one hand, thumb braced over the nose and fingers inserted between the mandibles with the other. The dog cannot bite or get his head loose.

No. 3. For dressing wounds, applying casts, etc., place the dog on a table after muzzling and by holding the feet with the hands it is possible by exerting elbow and arm pressure to control any struggling.

—Edwin J. Frick.

Rhododendron Poisoning of Young Dogs

R. W. GERDEL,
Wooster, Ohio
Phytochemist, Ohio Agricultural Experiment Station,

THE recent fad for evergreens and their use in landscaping with the often included broad-leaved evergreens such as the Rhododendrons and Mountain Laurel (Kalmia) presents a hazard to young pet stock, particularly young puppies, which the average veterinarian is not likely to consider seriously, or to even recognize. The following case will illustrate however how real the hazard of Rhododendron poisoning may be.

A LITTER of Irish setter puppies were whelped and raised in a warm building with a concrete floor. At eight weeks old they were turned out on a lawn which included among various other ornamental evergreens, several Rhododendrons. Before realizing the hazard involved, one puppy had started to demolish one of the smaller Rhododendron bushes and was observed in the act of swallowing one of the leaves. Forty-eight hours later this puppy became quite ill, the first symptoms were vomiting, followed by diarrhea. The feces soon became watery and blood-streaked.

Two days later, two more puppies unfortunately gained access to the same Rhododendrun, and on the following day still another pup was able to finish demolition of this plant. In each case the puppies were actually observed in the act of chewing or swallowing parts of the leaves or the greener twigs. Within 48 hours these three puppies exhibited the same symptoms as the first puppy.

ABOUT 96 hours after these puppies had eaten the Rhododendron leaves, and about 48 hours after the first symptoms appeared, a semi-paralysis set in. The puppy would make an effort to rise, but would give every evidence of being unable to use the hind legs or the front legs as the case might be. This paralysis was transitory in nature, sometimes the front legs were involved while a few hours later the hind legs would be involved. Though somewhat emaciated by this time, there seemed to be considerable strength left and the puppies would push their front legs or drag their hind legs across the floor when called or when being fed. For the most part they were always quite bright, exhibiting no signs of fever, nor was there any bloating.

THE first puppy to eat the Rhododendron leaves apparently secured the largest dose of the poison, for 6 days after becoming ill it was so emaciated and weak that its life was despaired of. On the evening of the 6th day however it quite suddenly recovered the use of its legs and within 12 hours was entirely well. Diarrhea had ceased and it was as active as any of the healthier pups which had never touched the Rhododendron. The three others went through a similar siege but did not become quite so weak or emaciated, though the duration of their sickness, or rather, the time required to eliminate the poison was very nearly the same as for the first puppy. Paralysis was probably not quite so severe.

SINCE this litter of nine puppies were all kept together and only the sickest one separated, and that only for a few days and by only a light wire fence, and since five of the nine pups did not ingest Rhododendron to our knowledge, nor did they become ill, and the four that did in-

gest Rhododendron leaves or twigs exhibited all the symptoms for sheep poisoning as outlined by Marsh, et al., the author feels justified in classifying this as a case of poisoning due to the andromedotoxin of Rhododendron. The only difference between the symptoms given for sheep and those observed in these pups was the difference in time between ingestion of the material and the onset of symptoms, sheep apparently exhibit the symptoms within 12 hours.

THOUGH a local veterinarian prescribed bismuth pills, and these were given to the first puppy at two-hour intervals for three days, Marsh,[1] et al., recommended linseed oil, and oils in general. Unfortunately this information was not available until the puppies were already quite weak from the poison. They were being fed a large quantity of raw whole milk each day, and following the appearance of symptoms in the second group to become poisoned, the milk was boiled before feeding the puppies, also a commercial feed containing a large amount of dried buttermilk was used. Whether this was of any aid cannot be told from the limited application in this case. Probably the puppies would have survived regardless of treatment, since Marsh, et al.[1] state that the lethal dose for most livestock is from 0.2 to 0.4 of the weight of the animal. Obviously, for young puppies weighing five to six pounds each, the lethal dose would be more than they would likely eat, though it is also stated that young animals are much more susceptible to the poison than are older ones.

Petty prejudices, shackles of tradition, bias, crass selfishness and greed for power must give way sooner or later to critical common sense, the consensus of opinion of the best judges in such matters, and the facts of experience.—Patry, in *Medical Times.*

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[1]Marsh, C. D., et al. U. S. D. A., Tech., Bul. 219.

FOX'S MILK

The approximate composition of vixen's milk is as follows:

Water	81.87
Total Solids	18.13
Protein	6.25
Fat	6.30
Lactose	4.56
Ash	.96

Thus cow's milk is unsuited for fox puppies. Milk from ewes is better suited for fox puppies, but cat's milk is the best substitute.—*Bio. Abs.* 7-4-9085.

GAPES IN MARYLAND 136 YEARS AGO

In 1797 Dr. Andrew Wisenthall of Baltimore, wrote: "A disease prevalent among the gallinaceous poultry called gapes, which destroys 80% of our fowls and occurs in the greatest prevalence among young turkeys and chickens bred upon old established farms. Chicks and poults in a few days after they are hatched, are found frequently to open their mouths wide and gasp for breath, at the same time sneezing and attempting to swallow. At first the effection is slight, but gradually becomes more and more pressive until it ultimately destroys. Few recover: they languish, grow dispirited, droop and die. It is generally known that these symptoms are occasioned by worms in the trachea. I have seen the whole wind pipe completely filled with these worms and have been astonished that the birds could breathe under such conditions."

In severe cases where death is imminent, Doctor Wisenthall recommended opening the trachea and removal of the Syngamus with forceps, stating that it gives immediate relief and that the trachea requires only one or two sutures and no after treatment. In less severe cases, he advised the insertion of a feather into the trachea to dislodge the parasites. He cautioned that the parasites that are removed must be destroyed to prevent further contamination of the ground and runs with eggs, and that chicks and poults should be raised on ground to which fowl had not had previous access for a period of at least a year.

Common Diseases of the Foot in Horses*

TO AVOID making this discussion unseemingly long I shall omit a consideration of laminitis, canker, hoof cracks and other ailments of the sole and hoof, which admittedly are common enough among the diseases of the foot, and confine the discussion mainly to the pathology of the bony structures of the foot. These fall into two classes, (1) fractures of which the immediate cause is a violent injury of some kind, although there may or may not be a predisposing cause of constitutional origin and (2) exostoses or degenerative diseases of the bony structures, of which not very much is known as to their cause. It is reasonably certain however that these latter conditions have an important predisposing cause in a diathesis conducing to disease of the bones, and perhaps an immediate cause in long-continued irritation of a rather mild sort.

Fractures

Occurrence and Type.—The great majority of fractures of the phalanges occur in the first phalanx—the os suffraginis of the older anatomies. Fractures of the second phalanx—the os corona, and of the third phalanx—os pedis, are rare. These accidents include every variety of fracture of long bones—simple, comminuted and compound, and longitudinal transverse and oblique.

Causes.—Fractures of the phalanges, and particularly of the first phalanx, are usually the result of a severe concussion of the foot with the ground, or of violent muscular action or a combination of both; such as galloping over frozen ground, falling in steeple chasing, jumping, slipping on icy footing and strains or falls incident to racing. Sudden turning in polo ponies and saddle horses may be a cause.

Severe contusions (kicks, gun shot wounds, collisions with automobiles and trains, etc.), are some times a cause. Nail pricks are probably the commonest cause of fractures of the third phalanx. Sometimes, in horses on which neurectomy has been performed, fractures occur with little apparent reason. Presumably a degeneration and weakening of the bone has taken place as a result of the operation or as a sequel of the primary condition that occasioned the neurectomy.

Symptoms.—Fractures cause severe, sudden lameness. The animal may carry the leg, or may hop on it just touching the foot to the ground. In transverse fracture, particularly during the first few hours the animal may bear weight on the leg when standing. Complete fracture of the first phalanx is usually easily detected by palpation. When the leg is flexed and the foot forcibly manipulated crepitation can be heard and felt. When either of the lateral tuberosities is torn off there is abnormal lateral movement of the foot and the loosened tuberosity usually can be felt, and moved slightly under the fingers. Fissures are very difficult—usually impossible—to detect by palpation and the x-ray must be resorted to for certainty.

FRACTURES of the second phalanx offer far more difficulty in diagnosis than do those of the first phalanx; however, the subjective symptoms are essentially the same. The objective symptoms are likewise the same but are more difficult to recognize, and the x-ray is necessary more often for confirmation of the tentative diagnosis.

FRACTURES of the third phalanx are extremely difficult to detect except on operation as for nail prick. One may suspect fracture of the os pedis when the pain, following nail prick, is out of proportion to that usually caused by such injuries. If the nail

*Notes from an address by Dr. J. P. Hutton, East Lansing, Mich., presented at the Annual Meeting of the Indiana Veterinary Medical Association, Indianapolis, Jan. 20, 1932.

prick is near the margin of the pedal bone the true condition is easily determined upon operation for repair of the injury.

Prognosis.—In comminuted fractures the prognosis is unfavorable. Destroy the animal at once. In compound fractures the prognosis is bad. Rarely, except perhaps in immature animals of exceptional value, should the treatment of the condition be undertaken. Fractures involving an articulation are very serious; arthritis generally develops and ankylosis usually follows.

Prognosis in fractures of the second phalanx, conditions being equal, is less favorable than in fractures of the first phalanx, and fractures of the third phalanx are still more serious. Fractures of the second phalanx and through the body of the third phalanx even where healing occurs usually leave permanent lameness.

The prognosis is generally favorable in simple transverse fractures of the first phalanx and in oblique fractures of this bone also if the fissure does not extend into either the proximal or distal articulation.

Treatment.—Simple fractures of the first phalanx should be placed in a plaster cast extending from the hoof to knee or hock. The parts must be immobilized as securely as possible until healing occurs. This requires great care and no little skill in the application of the bandage and particular after care of the patient.

TO APPLY the plaster cast, first see that the hair and skin are thoroughly dry; next wrap the leg with thin layers of cotton and over this turn a gauze bandage, avoiding folds and wrinkles as much as possible. Put extra layers of cotton about the fetlock and hold in place with a light bandage. The layer of cotton and bandage should be built up thick and even before the plaster bandage is applied.

The plaster bandage should be applied snugly and evenly over the foot and leg. After the first few layers are wrapped on, splints should be laid on and wrapped in to the cast, strips of hoop iron serve well for this purpose. They reinforce the cast strongly; being thin they do not cause uneven pressure and being flexible they are readily adapted to the contours of the surface.

After 24 hours the cast should be inspected carefully and again after 48 hours. If swelling in the leg is noted, or if the cast is becoming loose in places it must be removed and a new one applied. If all goes well the cast should be left in place for six weeks.

THE nursing of the patient is very important. The horse should be kept in a box stall, bedded with sawdust, short straw or peatmoss. The floor of the stall should be dirt, cinders, or other material affording a good footing. The bedding should not be too deep or of a material that makes it difficult for the animal to move about on three legs.

WITHIN a few hours after a plaster bandage is applied the animal will usually lie down. Ordinarily he lies on the sound side. The most critical time in the whole after treatment arrives when he attempts to rise for the first time. If he is unable to get up because of a slippery floor he may lose confidence and refuse to try again; when, of course, slings will have to be used since the patient cannot be permitted to lie down continuously. Horses with fractures do not do well in slings. It conduces much to their ultimate recovery if they are able to get up and lie down at will without hurting the injured leg and if they can move about somewhat on three legs. During convalescence the horse should be fed a ration with a high calcium content such as alfalfa hay or a calcium supplement.

SOMETIMES a nail penetrating the sole will strike the third phalanx near the margin, chip off a semilunar shaped segment and partially rotate it on its long axis. By forcing the sensitive and the insensitive laminae apart this sequestrum causes an extraordinary amount of pain. It should be operated upon immediately. It is necessary to follow the tract of the nail puncture in from the sole and make an opening sufficiently large to remove the sequestrum. Relief is immediate and subsequent treatment does not differ from that of an ordinary nail puncture.

Ring-Bone

By ringbone is meant a rough bony deposit extending more or less completely around the pedal articulation—low ringbone or the coronary articulation—high ring-bone. The deposit of bone in these regions is looked upon as being the result of a chronic inflammation. But accounting for the cause of the chronic inflammation is not so satisfactory. Ring-bones are prone to occur in pairs or on all feet of the same animal and to be associated with side-bones, spavins, and erosion of articular surfaces. It is illogical to assign their cause to an agent acting locally only, such as chronic inflammation of the part affected. By some the condition is looked upon as a hereditary one. Defective conformation, bad shoeing, fast work on uneven ground, sprains and contusions are looked upon as exciting causes. In my experience the condition seems somewhat less common than it was 25 years ago.

RING-BONE is generally classified as articular or peri-articular ring-bone depending upon whether the articular surface of the joint or only areas adjacent to, but not involving, the joint are affected.

Articular ring-bone is a chronic arthritis. The disease may originate in the articular cartilage or, originating adjacent to the articular surface, may extend to it. In this condition the articular surfaces become eroded and bony deposits are formed immediately adjacent to those surfaces. The end result is complete destruction of the articular cartilages and ankylosis.

Peri-articular ring-bone is that form in which there are bony deposits about the borders of the coronary or pedal articulations or at the insertion of ligaments of the region, the articular surfaces however remaining unaffected.

Symptoms.—Ring-bone, whether articular or peri-articular, almost always causes lameness. In the latter, lameness may be slight and may almost wholly disappear from long rest to recur when the animal is put to work again. In time the hoof and muscles of the affected leg exhibit atrophy. The lameness is increased by pivoting the animal on the affected leg or turning it in a small circle with the affected leg on the inside. Pain is shown when the affected joints are forcibly flexed, extended and rotated with the leg lifted.

DETECTING ring-bone by palpation depends chiefly upon the amount of bony deposit. These deposits differ greatly in amount, sometimes being so slight as to be difficult or impossible to "feel" with assurance and ranging up to enlargement that can be noted upon even the most casual inspection, and causing marked disfiguration.

Prognosis.—The prognosis in a given case of ring-bone depends more upon its location than upon its size. In the articular type it is always grave, and it is hopeless if there is much destruction of the articular surfaces. Peri-articular ring-bone located in front of the joint and so near to it as to limit motion is incurable even though it be small. Exostoses on the medial and lateral surfaces of the bones and not involving the articulation offer a fair chance for recovery if the exciting cause can be removed. Ring-bone lameness due to tramnatisms generally disappears when the active cause is removed providing the enlargement does not interfere mechanically with motion in the parts. Ringbone in the hind feet is less serious than in the front feet and in aged horses is less serious than in young horses.

Treatment.—In the articular form neurectomy affords the only palliative. It will usually relieve the lameness provided there is no ankylosis of either joint. If there is ankylosis, mechanical lameness will persist even though the pain be relieved. In articular ring-bone of the front feet median neurectomy should be tried first. If the relief of pain is not sufficient (due to the volar branch of the ulnar nerve reaching the diseased parts) plantar neurectomy may be performed. In ring-bone in the hind feet there are also two neurectomy operations available—the high plantar and posterior tibial. The former is the surer. Neurectomy is a last resort to be performed only in hopelessly lame subjects. It offers a possi-

bility of restoring usefulness for a limited time.

The treatment of peri-articular ring-bone is nearly always unsatisfactory, probably because we treat only a local manifestation of what is probably a constitutional condition. Deep point firing into the exostoses followed by weeks of rest is more often successful than any other plan of treatment. Strong blisters applied over the bony enlargements is a treatment commonly employed. Its value other than the rest it affords is doubtful.

WHETHER a cure of ring-bone is attempted or whether it is deemed proper to work the animal for a while longer because the pain and lameness are slight, it is important to shape the foot properly and keep it in that condition and make any corrections that are practical by shoeing. The foot axis should be kept straight, viewed both from the front and the side. High heels, a high side wall and a long toe each and all aggravate the condition.

Side-bones

Ossification, either partial or complete, of the lateral cartilages of the third phalanx is termed side-bone.

Occurrence.—Side-bone is common in draft horses, particularly in draft horses doing heavy work on hard surfaces. It may occur however in young unbroken horses. It is rare in light horses—trotters, thoroughbreds and saddle horses.

Side-bone seldom occurs in the hind feet. In the front feet it is found more often on the outside than on both sides, and is relatively rare on the inside alone.

Cause.—Side-bone like ring-bone has in back of it a predisposition, perhaps inherited. Excessive concussion is given as an exciting cause, but the force of the statement is lessened by the relative rarity of the condition in trotting and saddle horses as compared to its prevalence among slow-moving, heavy draft horses.

Shoeing with high calks, thus preventing frog pressure and subjecting the lateral cartilages to an abnormal amount of downward drag at every step and mechanical injury is regarded as one cause of side-bone. That the outer cartilage is more often affected than the inner one is explained by some on the theory that the outer sector of the normal hoof being larger than the inner sector it suffers the greater shock and strain.

Symptons.—Side-bone cannot be recognized until ossification has progressed to a point where it can be felt through the skin of the quarter. When the normal foot is lifted the lateral cartilages can be palpated with the thumb and index finger. They are quite flexible. In side-bone the cartilages are firm, unyielding or solid depending upon the degree of ossification. When completely ossified they are often enlarged to a degree that a swelling is plainly visible; sometimes so large as to cause marked disfiguration of the foot.

OSSIFICATION of the lateral cartilages always interferes with the function of the foot; limiting expansion and contraction which is necessary to health of the foot and an elastic untiring gait; but it is only when ossification is complete and enlargement of the side-bone is considerable that lameness is likely to occur. Only a small percentage of horses having side-bones are ever made lame by them. It is characteristic of side-bone lameness to disappear when the animal is rested and recur when put to steady work again.

Prognosis.—Side-bone is incurable. We know of no way to reduce the enlargement or restore elasticity to the cartilage. However the horse generally continues useful; by appropriate treatment lameness if present can be relieved.

Treatment.—Unless a horse becomes lame from side-bone, treatment is unnecessary. It is powerless to arrest the progress of ossification or to undo it. Here again our treatment is directed against a local manifestation of what has probably a deep-lying cause. The result is a natural one under the circumstances, just nil.

Where lameness supervenes on the formation of side-bone, treatment is indicated. First the foot should be properly shaped; side walls, heels and toe of the proper pro-

portion to bring the foot axis to a straight line viewed from the front or side. Farm horses should go unshod all the time. Horses working on streets or paved roads should be shod with simple plates only.

WHERE lameness persists after proper trimming or shoeing the seat of the pain should be determined accurately and a section of the volar nerve supplying that side of the foot, removed. Where there is a side-bone in both the lateral and medial quarters, the outer is usually the larger and the cause of the lameness. This can be determined with exactitude by anesthetizing first one and then the other of the volar (digital) nerves, allowing sufficient time between the injections for the effects of the first anesthetic to pass off. The injection should be made just above the fetlock. If, as occasionally happens, the lameness is bilateral its relief requires plantar neurectomy on both sides. Unilateral volar neurectomy is a simple operation, completely successful in unilateral, side-bone lameness and fraught with no untoward sequellae. Bilateral plantar neurectomy on the other hand is more serious and should be performed only when it is apparent the usefulness of the animal will not be restored by time and less radical treatment.

Quittor

Quittor is a term applied to a chronic suppurative inflammation of the lateral cartilage and adjacent tissues. It is characterized by chronicity, swelling, the formation of fistulous tracts and sinuses, a progressive necrosis of the lateral cartilage and recidivation when healing of the fistulous tract and subsidence of the swelling occurs spontaneously.

Causes.—Quittor is a result of infection of the lateral cartilage usually brought about by contusion such as calk-wounds or bruising of adjacent structures from treading, or extension from an infected corn or a gravel working up along the white line and setting up an infection in the sensitive laminae with a consequent burrowing of pus into the quarter. The meager blood supply of the cartilage and its feeble reparative powers predisposes this organ to infection and, once infected, to progressive necrosis.

Symptoms.—Quittor is usually ushered in by a swelling of the coronet of the quarter and of the bulb of the heel. An abscess forms and discharges a bloody pus; leaving a fistulous tract. The swelling and pain if present subside when the abscess discharges its pus. The fistulous opening usually heals after a time and is followed by more swelling and another opening. The pus keeps burrowing in the quarter until ultimately it is honey-combed with fistulous tracts and sinuses and there may be several openings through which pus is constantly or intermittently discharged. Infection soon reaches the lateral cartilage and it gradually sloughs away. The infiltration and swelling sloughs about a greater or less deformity of the quarter including the hoof. The infection may extend to the pedal joint with fatal consequences, but such outcome is rare.

LAMENESS is not a constant symptom of quittor. It is usually present during the acute stage but frequently disappears during the free discharge of the abscesses and subsidence of the swelling to reappear at the next recidivation. However there are cases that at no time manifest lameness; rather surprising in view of the extensive involvement of sensitive structures.

Prognosis.—Few cases of quittor recover spontaneously. Untreated the case may be expected to continue for months and years. When there is much deformity of the hoof treatment is rendered more difficult. When properly operated upon the prognosis is good but the time required for recovery is considerable and the service of the animal may be lost anywhere from three weeks to three months depending upon the type of operation performed, the kind of work required of the animal and the severity of the case, i. e. the amount of the deformity in the foot and the extent of the fistulous tracts.

Treatment.—In treating quittor one has a choice of three standard operations. All are successful ordinarily; all are performed under anesthesia, local or general, and all require the use of the tourniquet to control

hemorrhage, which otherwise is extreme in these tissues, and that the wound be securely packed and tightly bandaged to control the hemorrhage after the operation is finished.

THE oldest of these operations is known as the Bayer operation. It consists in thinning the hoof wall over the quarter until it can be cut readily. Then making a semi-circular incision through the wall and sensitive laminae extending from the coronary band opposite the anterior border of the lateral cartilage down as low or slightly lower than the lower border of the cartilage and up to the coronary band opposite the posterior margin of the cartilage. The incisions are then extended through the coronary band and skin to inner side of the cartilage; the flap of the hoof and skin separated from underlying tissue and lifted thus exposing the cartilage. The cartilage and diseased tissue is then excised and the flap replaced. The principal disadvantage of this operation is the long period for which it lays the horse up.

A SECOND operation is the Williams operation which differs from the former in that two eliptical incisions are made meeting at but not passing through the coronary band. Its principal advantage over the older Bayer operation is that the coronary band is not incised and where there is not much deformity of the foot a smoother hoof may result upon recovery.

A THIRD operation, and one that I prefer where the deformity is not too great is called the "French operation." It consists in making an incision over the upper border of the lateral cartilage, extending from just anterior to the anterior margin to just behind the posterior border. The incision is carried down the inner face of the cartilage to a level with the coronary band. A horizontal incision is then made at the level of the coronary band to meet the first incision and the excised tissue removed and the remainder of the cartilage removed by curetting. This operation is more simple to perform than the Bayer or Williams operation and lays the horse up for only about one-third as long.

ANOTHER method of treatment is to put in a seton through the hoof wall and the fistulous tract. Still another is the injection of caustics into the fistulous tracts. Since success requires the removal of the necrotic cartilage and providing good drainages these methods are limited in application.

Smith of Duke University reports that 13 different fungi may infect the lungs (of man) and cause symptoms like those of tuberculosis. He recommends the treatment of all forms of mycosis with large doses of potassium iodide. Patients who do not respond to that treatment are given in addition ethyl iodide inhalations.

AT THE CHICAGO A. V. M. A. MEETING

The program for the Military Medicine Section of the 70th Annual Meeting of the A. V. M. A. in Chicago, Aug. 14-18, 1933 will present topics for consideration that cover all phases of the Army Veterinary Service. These subjects should be of interest to the profession both in and out of the military service.

At the present time the government is giving a great deal of attention to the mechanization and motorization of army units, the development of an army veterinary service to meet present day requirements is of utmost importance to our profession. The possibilities for such developments are fully recognized.

The War Department is placing more and greater responsibilities on the Veterinary Corps in connection with military sanitation and also the inspection service covering animals, forage and meat food and dairy products.

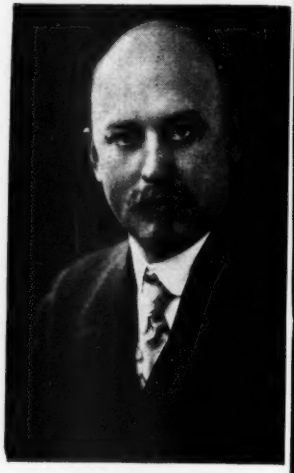
These matters concern the profession as a whole; those not familiar with present day developments in this service should attend this session and learn of them. Veterinarians, who can qualify for commissions in the Reserve Corps, will find matters of particular interest to them at this session.

A New Honor for Chief Mohler

E. Leclainche

A. Eichhorn, who returned the latter part of June from an European trip during which he attended a meeting of the Permanent Commission of the International Veterinary Congress in Paris May 20th, brings word that because of prolonged illness Prof. Dr. Franz Hutyra, Rector of the Royal Hungarian Veterinary High School, Budapest, resigned from the presidency of the Commission and Prof. E. Leclainche, Chief of the Government (France) Veterinary Services, Paris, one of the vice-presidents of the Commission, was elected president to fill the vacancy.

Doctor Eichhorn submitted the name of Dr. John R. Mohler, Chief of the Bureau of Animal Industry, United States Department of Agriculture, for Vice-President of the commission to fill the vacancy created by the election of Prof. Leclainche to the presidency. The nomination was unanimously approved by the representatives of the 20 nations that were present, and Chief Mohler thus becomes one of the vice-presidents of the Permanent Commission of the International Veterinary Congresses. Sir John McFadyean, M. B., B. Sc., C. M., LL. D., M. R. C. V. S. (Great Britain) is the other vice-president.



John R. Mohler

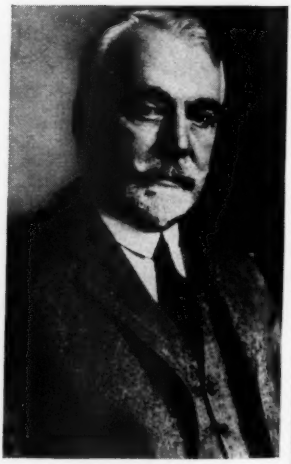
The Permanent Commission with headquarters at the Hague, Holland, is the supreme governing body of the International Congresses and forms the connection link between successive Congresses. On this committee eminent veterinarians selected from the principal countries of the world serve. It decides among other things the programs of meeting, and the main purpose of the meeting in Paris in May was to adopt a program for the twelfth Congress which will be held in New York City in August 1934. With but minor alterations the tentative program submitted by the Organizing Committee for the next congress was approved. This program has already been published in this magazine.

Professor Doctor Franz Hutyra

Franz von Hutyra was born at Szepeshely, Hungary, in 1860. He was graduated from the University of Budapest (M. D.) in 1883. After four years as assistant in the pathological institute, he went to the Budapest veterinary institute as adjunct, teaching of pathological anatomy, and in this period qualified for a diploma of veterinary physician. In 1888 he was appointed associate professor and took up the directorship of the medical clinic together with the teaching of hygiene; since 1900 he has lectured only in the latter subject and veterinary legal medicine.

After the reorganization of the institute into a veterinary academy, he was appointed its director and after its further reorganization into the veterinary high school he became its president (rector), in which office he remained till 1917 and thereafter was reelected in successive two-year periods until 1931. Having obtained in 1889 the title, "Privat-Dozent," in the Budapest university, he received in 1899 the title of associate professor, and in 1922 the title, honorary professor, of the university of Pecs, and also honorary professor of the veterinary high schools in Vienna and Berlin. He has been chairman of the National Veterinary Association since its formation in 1900. During the period 1906 to 1921 he was president of the Hungarian Association of Veterinary Physicians. As executive vice president, he organized the VIII International Veterinary Congress in Budapest in 1905 (this Con-

(*Continued on Page XIV*)



Franz Hutyra

PARALYSIS OF THE DIAPHRAGM IN A CAT

Subject.—Female, orange, tabby, persian cat; age two years; had been spayed about six months previously.

History.—The animal was presented at the veterinary clinic of the Kansas State College with a history of gradually having been developing a dyspnea. The owner stated that the cat was off feed and seemed depressed.

Symptoms.—The cat showed signs of abdominal breathing, obesity, increased shallow respirations, congested membranes, general depression, temperature normal.

Diagnosis. — Possible diaphragmatic rupture.

Prognosis.—Guarded.

Treatment.—The abdominal area was shaved and painted with tincture of iodine. The animal was anesthized; using ether. A median incision was made approximately four inches long into the abdominal cavity. The abdominal wall was approximately one inch thick, nearly all adipose tissue.

The diaphragm was then palpated and seemed relaxed; the diagnosis was changed to paralysis of the diaphragm. The intestines were palpated and the mesentery showed a great amount of excess adipose tissue, and two large lumps of fat were found pressing against the diaphragm. A handful of the excess amount of mesenteric fat and the two lumps of fat, which were found pressing against the diaphragm were removed. The abdominal incision was then closed by means of interrupted sutures. A boric acid pack was then placed on the wound and held in place by a bandage.

Results.—The cat was kept in the hospital for twelve days and then sent home, showing no signs of abdominal breathing. The animal had lost considerably in weight but was in a much better physical condition than when brought to the hospital.

The owner was advised to watch the animal's diet and not allow the cat to become too fat. To date the animal appears to be perfectly normal.

Allen V. Brunke.

Manhattan, Kansas.

DO YOU REMEMBER?

1. *Question.* What is Poupart's ligament?

Answer. Poupart's ligament is the strengthened part of the aponeurosis of the obliquus adbominis externus muscle in the inguinal region. It is also called the inguinal ligament, though it is not truly a ligament.

2. *Q.* Name three kinds of leucocytes.

A. The three kinds of leucocytes are lymphocytes, monocytes and granulocytes. Granulocytes may be sub-grouped into neutrophiles, eosinophiles and basophiles, according to their nature of granulation.

3. *Q.* What are the chief functions of epithelium?

A. The chief functions of epithelium are: Protection secretion and absorption, diffusion, excretion, lubrication and for receiving stimuli.

4. *Q.* What is allergy?

A. Allergy is any variation of reaction from the normal of living tissue to form chemical agents—either antigenic or non-antigenic.

5. *Q.* Can a mammal be raised to normal maturity on cow's milk only?

A. So far as is known, a mammal cannot cannot be raised to maturity on cow's milk alone, due to the development of anemia. The addition of iron, copper and traces of manganese to the milk prevents anemia, but it is not yet practicable, partly because of the lack of knowledge pertaining to the amounts to be added to balance with the organic constituents of the milk so as to result in a normally matured animal.

Wesley O. Keefer,

Ramsay, Mont.

Ovine contagious pustular stomatitis is an infectious contagious and readily transmissible malady caused by a filterable virus. One attack confers immunity.

Reviews and Abstracts

Carriers of Pullorum Disease

By F. VOLKMAR, Columbus, Ohio

THE author[1] summarizes that severely infected hens may be identified by the slow agglutination method as well as by the rapid agglutination. It is therefore possible to discover with the aid of the serological examination those hens which lay a high percentage of infected eggs. This examination does not enable one to identify all the hens which are lightly infected and which lay infected eggs occasionally only; for in infected flocks there are frequently hens which will react negatively during two laying seasons, but at the same time will lay infected eggs, though at long intervals. Hens artificially infected with Salmonella gallinarum will discharge the bacterium with the egg as late as 41 to 67 days after infection. They will exhibit the first positive blood symptoms 28 to 42 days after infection. The discharge of *S. gallinarum* with the eggs will last for several laying seasons in highly infected hens, but in lightly infected ones seemingly for a shorter period. Most of the infected eggs are laid during the peak of the laying season by those hens which are exposed to infection. The *S. gallinarum* bacillosis will at times check the egg production to the point of unproductivity. It is concluded that neither the blood examination nor the bacteriological examination of eggs, —which is practical over a short period of time only—, will discover all the carriers. A guarantee against pullorum disease cannot be insured therefore even then when bacteriological egg examinations are made at frequent intervals in addition to the blood examination. The exclusion of carriers, diagnosed by means of blood examination, from breeding in conjunction with sanitary measures will reduce the danger of spread of pullorum diseases considerably.

[1] Hartwigk, H. 1933. Die Ausscheidung des Bacterium gallinarum mit dem Ei und der Agglutiningehalt des Blutes bei künstlich und natürlich mit dem Erreger der bakteriellen weissen Kükenruhr infizierten Hühnern. (The carrier problem in Salmonella gallinarum bacillosis.) *Deutsche Tierarztl. Wochenschr.* 41 (12):179-183.

Diagnosis of Hog Cholera[2]

The infarcts are formed under the influence of a very virulent type of virus upon the vessel wall. They are pathognomonic for hog cholera . After subcutaneous injection of a highly virulent hog cholera virus, extensive hemorrhagic infarcts are formed within eight to nine days. After natural, peroral infection with normal virus, anemic and less extensive infarcts will result, sometimes as early as within five days.

Successful Treatment for Warbles and Scabies in Cattle

The authors[3] report excellent results from the application of Derris in the treatment of scabies and warble boils in cattle. The method of treatment is as follows: One kilogram finely powdered Derris is extracted and macerated with nine liters of cold water for at least 24 hours and repeatedly agitated during this time. The solution will assume a milky appearance. Then, 250gm soft soap are dissolved in one liter of cold water and added to the Derris-cold-water-extract, bringing the final amount of Derris extract up to ten liters. This preparation is to be used up within one week, else bacterial decomposition will set in. Smaller or larger amounts may be made

[2] Hirth, G. 1932. The significance of the spleen infarcts for the diagnosis of Hog-cholera. (Transl. title) *Allatorvosi Lapok* 1932:141. Abstr. *Deutsche Tierarztl. Wochenschr.* 41(6):92.

[3] Götze, R. 1933. Ueber die Derriswurzel (Tuba root) und ihre Anwendung zur Bekämpfung von Ektoparasiten bei Rindern. (The use of Derris for combating ectoparasites of cattle.) *Deutsche Tierarztl. Wochenschr.* 41 (9):129-131.

up by corresponding changes in the formula.

Application: Clipping of hairs is not necessary. The liquid preparation is applied by drops to the parts affected with the parasites until the skin is thoroughly moistened. Under vigorous massage the liquid is rubbed into the skin. The washing is to be repeated after two or three days. In heavily parasitisized animals and in larger animals approximately 300 to 400cc will be required for a treatment. In smaller amounts or in those having fewer parasites, 150 to 200cc of the washing fluid will suffice. Treatment is best applied 8 to 14 days before turning the animals out on pasture.

Variation in Blood Sugar Level in Cattle

Considering interestrus as the normal condition, then the blood-sugar is increased during estrus[4] and decreased during pregnancy. The rise in bloodsugar during the sexual cycle begins gradually with the resorption of the corpus luteum and the maturation of the graafian vesicle (9th, 10th day) and reaches its culmination with estrus. After the rupture of the follicle, the bloodsugar soon sinks to the level of interestrus. The lowest level of bloodsugar occurs during the formation of the corpus luteum. In pregnancy the bloodsugar has been found lowest during the first three months of gravidity. With the progress of pregnancy the values slowly increase, but remain below the average level of interestrus even after parturition, at the beginning of lactation, when estrus ceases. The sugar requirements of the fetus are put forward as the reason for the lowering of bloodsugar during pregnancy. The estral rise seems to be occasioned by inner-secretory conditions, caused by the regression of the corpus luteum and the secretion of the graafian follicle and the mechanical influence of the irritation from the nervous tension in the ovulating ovary.

[4] Demmel, M. 1933. Der Blutzucker im Sexualzyklus des Rindes. (The relation of blood sugar in the sexual cycle of cattle.) *Deutsche Tierarztl. Wochenschr.* 41 (8):117-119.

Storm of Abortion in Ewes

In a flock of 368 ewes over 52% aborted.[5] The cause of the abortion was a spirillum infection. The diagnosis was based upon the demonstration of the spirillum in the fetuses by cultural methods, and by the presence of agglutinins in the blood of the ewes after abortion. In the animal experiment, affinity of the spirillum for the uterus was observed. One guinea-pig was injected subcutaneously, another one intraperitoneally; in the latter the spirilla appeared in the blood four days after injection. The resistance of the spirilla to heat and dryness is extremely low. In liquid media they will survive for at least 9½ months. The dependence of the microbes upon fluid gives rise to the assumption that transmission takes place by means of the drinking water. The explosive abortion is more suggestive of a simultaneous intake of the germs by the entire flock than of a contact transmission.

Atypical Rabies[6]

It is recognized that, in rabies of the dog, lesions of gastro-enteritis may be found on autopsy. Puntoni has recently published his observations on six cases of rabies in dogs in which the gastro-intestinal derangement masked all other symptoms. In his opinion sufficient importance has not been attached to the gastro-intestinal syndrome which may occur in canine rabies. Bailly, Velu and other authors have also drawn attention to this matter.

According to the present authors, rabies of an intestinal type is not uncommon in Greece. They record in detail the history of a case. The original diagnosis was a hemorrhagic gastro-enter-

[5] Berge, R. and Schoop, G. 1933. Spirillen als Ursache für seuchenhaftes Verlammen. (Spirilla as cause of an enzootic abortion *Deutsche Tierarztl. Wochenschr.* 41 (5):65-68.

[6] Ananiadès, B., & Antoniadès, C. (1932). Syndrome gastro-intestinal de la rage chez—chien. (Gastro-Intestinal Syndrome of Rabies in a Dog).—Rev. gén Méd. vét. 41. 331-332. [4 refs.]

itis. The dog did not at any time exhibit a change of behavior, aggressiveness, inco-ordination of movement or signs of paresis or paralysis. The owner was accidentally injured while trying to administer medicine forcibly to the dog and his appreciation of the frequent occurrence of rabies in dogs in Greece led him to raise the question of this disease. Antirabic treatment was administered to him at his request, not because rabies was suspected. The dog died suddenly on the third day after coming under observation. On autopsy there was found to be a congestion of the whole intestinal tract and marked hemorrhagic areas were present in the stomach and duodenal mucous membrane. No foreign bodies were found in the stomach. Negri bodies were found on histological examination of the brain and a rabbit inoculated with an emulsion of the medulla died of rabies. The authors emphasize the need for caution in the forced administration of medicaments to dogs even when rabies is not suspected.—*Veterinary Bulletin.*

A South American Disease Resembling Rabies

It is only comparatively recently that this disease,[7] which was first described in 1913 as enzootic paraplegia in cattle, made its appearance in Paraguay. During the last five years 50% of the stock have been affected in certain districts and the death rate, never less than 95%, has reached, at times, 100%. The disease is now looked upon by farmers as the most important of all those with which they have to contend. Several workers have been engaged in solving the cause of the plague and Migone and some other earlier ones, including Aranda and Osuna, attributed the cause to a poisonous plant known locally as "Caábó-Pochy" (*pomohea digitata*). Later, in 1926, it was said to be a form of hemmorrhagic septicemia, due no doubt to the fact that certain workers from Brazil and Uruguay had stated that a similar condition in their countries was due to this cause.

In March, 1931, the authors started their researches into this disease and they proved that "mal de cadéras des bovidés" in Paraguay is caused by a virus closely allied to the rabies virus, differing in certain characters particularly in its virulence, which goes to suggest the plurality of the virus.

The clinical picture of the disease is described in detail and the authors emphasize that the two predominating factors are (1) the great range of the clinical symptoms and (2) the very high death rate. There are two forms of "mal de cadéras des bovidés":—(a) the quiet form and (b) the furious form. In most animals the earliest symptom is incoordination in the hind quarters and this is soon followed by paralysis. These symptoms are responsible for the unfortunate name of the disease (mal de cadéras) which confuses it with trypanosomiasis. Affected animals isolate themselves from the rest of the herd; they are easily disturbed, rumination ceases, there is frequent passage of small amounts of urine and there is constipation. The animals go down after two or three days, but they frequently sit up moving around on their haunches as on a pivot. Occasionally cases are seen with paralysis in the fore quarters.

In the furious form the animals bite themselves and will even attack other animals or human beings. In this form there is always impaired vision and the animals walk blindly into objects; similar results were seen in one of the experimental rabbits. In the majority of cases the animals live for from three to four days after they are down, but some cases last for 12 days especially when it is possible to feed the animal. Just before death the temperature is subnormal, but in the earlier stages there is always fever (38.5° to 40.5° C.) and the muzzles are dry in spite of continuous salivation.

[7] Migone, L. E., & Pena, R. (1932). Le mal de Cadéras des bovidés due Paraguay. (Bovine Mal de Caderas in Paraguay).—Bull. Soc. Path. exot. 25. 590-597.

Migone and Peña summarize the results of other workers (Carini, Haupt, Rehaag, Desousa, Carneiro, Lima, Costa and Acosta) who studied a similar plague in southern Brazil and the northern part of the Argentine, and point out that these authors agree with them in attributing the disease to the rabies virus. There are certain points still to be investigated [it is presumed that Migone and Peña are referring chiefly to the mode of transmission and protective inoculation or vaccination] and the work they have done will help to clear up these points.

Remlinger and Bailly, working with the virus sent from Paraguay by Rosenbusch, have now definitely agreed, as the result of cross immunity and serum neutralization tests, that the virus is that of rabies, although at first they called it a form of pseudo-bulbar paralysis. It is contended that the delay in deciding about the nature of the virus was due to the fact that rabies was never considered to be capable of displaying such marked variations in the clinical picture in animals and man. When the disease first occurs in an area there are at first only isolated cases but later the numbers gradually increase with intervals during which it appears to have abated. It may take as long as three, ten, or even twenty months for the plague to reach its highest level; the disease never spreads readily from one area to another and often there is a clean district surrounded by several badly infected ones. Another fact which goes to prove that the disease is not directly contagious is that, when animals are removed from an infected area to a healthy one, deaths continue to occur in these animals up to two and a half months afterwards while the other animals in the new area remain quite healthy, though in contact; it is further presumed from these findings that the period of incubation can be as long as two and a half months. All classes of livestock (horses, pigs, sheep and dogs) are affected and in horses the disease can easily be confused with trypanosomiasis, but the diagnosis of real "mal de cadéras" can easily be made by demonstration of the presence of trypanosomes in the blood. The condition in the dog is very important as that animal is looked upon as the most likely transmitting agent. By careful investigation real rabies in the dog can be distinguished from the "mal de cadéras" form of the disease.

Post-mortem findings except those of the central nervous system are not significant, and where they do occur, especially in the digestive tract, they are secondary and due to paralysis. The most important pathogenic changes affect the central nervous system. The meninges are congested, especially those of the brain, and there is marked leucocytic invasion of the cerebrospinal fluid. In the pia mater the capillaries are distended and there is marked congestion of the choroid plexus. In the brain there is a perivascular infiltration of the capillaries by round cells and lymphocytes and the nerve cells show a granular degeneration with vacuolated nuclei. In sections of the hippocampus (Mann's stain) large numbers of Negri bodies can frequently be demonstrated but, as Remlinger and Bailly have pointed out, these bodies are not always present and to demonstrate them it is sometimes necessary to inoculate a series of laboratory animals.—H. V. M. Metivier in *The Veterinary Bulletin.*

Anatomy of the Digestive Tract of the Fowl

A thesis[8] submitted to the Graduate Faculty of the Iowa State College in partial fulfillment of requirements for the Degree Master of Science gives a very complete review of the literature on the subject, including 249 references, an astonishing number on this subject, together with the author's own findings in a microscopic study of the digestive tract of chickens of different ages together with

[8]Calhoun, M. Lois; The Microscopic Anatomy of the Digestive Tract of Gallus domesticus. Iowa State College *Journal of Science,* Vol. VII, No. 3, 1933.

its appendages. The author's findings are summarized as follows:

The general structure of the wall was as follows: a mucous membrane comprised of an inner epithelial lining, a tunica propria and a muscularis mucosae; a thin submucosa; a lamina muscularis with an inner circular muscle layer and an outer longitudinal muscle layer; and an outer adventitia or serosa depending on the location of the organ.

The epithelium of the mouth contained many epithelial papillae which projected posteriorly. The muscularis mucosae was absent as far back as the caudal part of the pharynx. Uniformly constructed salivary glands were observed in groups in the submucosa.

Large mucous glands were present in the tunica propria of the esophagus. No glands were found in the diverticulum of the crop but were confined to the esophageal wall of that organ.

The stratified squamous epithelium of the esophagus changed into simple columnar epithelium at the junction with the proventriculus and continued as such as far as the anus.

The proventriculus contained simple tubular-formed superficial proprial glands and multilobular deep proprial glands.

Between the proventriculus and the gizzard was an intermediary zone characterized by the disappearance of the deep proprial glands and a lengthening of the superficial glands with the appearance of a keratinized inner layer.

The gizzard was characterized by a keratinized inner layer. Tubular glands, which emptied on the surface, were arranged in groups in the tunica propria. The lamina muscularis was a single layer of involuntary muscle.

The intestine from the gizzard to the anus, including the caeca, was characterized by villi. No Brunner's glands were present in the duodenum. No Payer's patches were found.

The caeca contained many plica circulares. The villi were low to absent in the blind end.

The cloaca contained many transverse folds and plica circulares in its walls.

The anus was lined with stratified squamous epithelium, and contained voluntary muscle in its walls.

The liver and the pancreas were similar in structure to those of mammals. The two pancreatic and the three bile ducts opened into the duodenal papilla.

The bursa cloacae was an organ of lymphoid-epithelial structure found only in chickens under one year of age.

Laryngotracheitis in Chicks

In this contribution[9] from the Kansas Experiment Station the authors describe a disease met with during the hatching season of 1930 among baby chicks, commonly designated "gasping disease," which caused widespread loss throughout the Middle West.

The work has shown that the "gasping" symptom is due to a filtrable virus infection with severe involvement of the larynx, trachea, bronchi, and lungs. In a large percentage of the field cases the symptoms are complicated by pullorum disease, and occasionally by infection by nonspecific organisms of known or unknown nature. The symptoms and lesions in the chicks are similar to those seen in so-called largyngotracheitis of adult birds, and are probably due to the same agent. Typical symptoms have been produced in chicks by intratracheal, subcutaneous, and intraperitoneal injection of filtrate from typical tracheitis in adult birds and again transmitted to adult birds by filtered material from these chicks.

The Passage of Fluids Through the Ruminant Stomach

In a study[10] of the passage of fluids through the stomach of 140 sheep, it was not found that the administration of certain mineral salts per se markedly influ-

[9] Bushnell and C. A. Brandley; Laryngotracheitis in Chicks. *Poultry Science*, 12 (1933), No. 1, pp. 55-60. Abst. in the *Experiment Station Record*, Vol. 68, No. 6.

[10] Ross, I. C.; The Passage of Fluids Through the Ruminant Stomach; *Agriculture and Livestock in India*, 2 (1932), No. 4, pp. 425-443. Abst. in the *Experiment Station Record*, Vol. 68, No. 6.

enced the passage of fluid to the abomasum instead of to the rumen and reticulum. Fluids pass much more regularly to the omasum and abomasum in sheep which have been allowed no water (or food) for 40 hours than in those allowed no water for lesser periods. Where water and food are withheld for 40 hours, fluids pass to the abomasum in at least 75 per cent of cases, irrespective of the nature of the solution given. When water is not withheld prior to dosing, fluids pass to the abomasum in a minority of cases only, passing to the rumen and reticulum in the majority. Anthelmintic efficiency of drugs would probably be increased substantially by withholding food and water for 40 hours prior to the dosing, owing to the greater regularity with which drugs would enter the abomasum in concentrated solution. Smooth solid particles up to 3/8 in. in diameter will enter the omasum or abomasum when given in fluids which enter these divisions of the stomach directly.

Pregnancy Disease in Sheep

The authors[11] report upon a study of the toxemia of pregnancy, one of the most common causes of loss among ewes in the late winter and early spring before the appearance of grass. The losses in individual flocks sometimes amount to 25 per cent, and the case mortality is about 90 per cent. The disease develops during the last month of pregnancy under two sets of conditions: (1) In ewes which are well fed and are in fair to excellent condition, it being associated usually with a lack of exercise, and (2) in sheep which are in poor flesh as a result of an inadequate ration.

It is pointed out that the disease is not infectious in character. Pathological changes are confined to the liver and kidneys. There is an enormous increase in the fat in the liver, so that a content as high as 68 per cent (dry basis) has been found as compared with 10 to 11 per cent for the normal animal. This is considered to represent injury from toxic substances with the consequent deposition of fat rather than a manifestation of plethora. The nephrosis present is a result and not a cause of the disease.

The acidosis, which arises in a deficient endogenous supply of carbohydrate which follows liver injury and the impairment of the glycogenic function, is responsible for the altered physiology and the symptoms of the disease. The ketone acids, which form in that abnormal metabolism, promptly deplete the alkaline reserve through decomposition of the blood bicarbonate, so that the salts of those organic acids are excreted and the acid-base balance of the body protected.

There seems as yet to be little encouragement in attempting to treat those ewes in which the disease is already well established. More satisfaction will be secured by prompt attention to measures of prevention. Liberal exercise will check the losses in flocks which are in good condition where deaths have occurred through some irregularity in the care. An adequate ration of good quality combined with liberal exercise will be the best safeguard in preventing losses in breeding ewes.

The Etiology of Periodic Ophthalmia

The author[12] points out that the infectious nature of periodic ophthalmia is purely hypothetical and that the etiology of the disease has never been determined. He reviews the work of von Scilly and his pupils, who found that rabbits injected intracorneally with sterile sheep serum showed an acute keratitis when inoculated intravenously with the same serum two to four weeks later. Similar experiments have been carried out by Manninger on horses, and this author considers that periodic ophthalmia is a toxemia set up by the absorption of proteins in the large intestine. Gmelin found a heavy

[11]Roderick, L. M., and G. S. Harshfield; Pregnancy Disease of Sheep. North Dakota Agr. Exp. Sta. Bul. 261 (1932), pp. 31. Abst. in the *Experiment Station Record*, Vol. 68, No. 6.

[12]Leclanche, E., The Etiology of Periodic Ophthalmia, *Rev. Gén. de Médecine Vétérinaire*, Vol. XLII, No. 495. Abst. in the *Veterinary Record*.

ascaris infestation in affected horses and suggests that the parasites may be responsible for the production of albumins giving rise to aphylactic phenomena in the eyes. The author concludes that although proteins may play an important part in setting up periodic ophthalmia it is probable that other circumstances and conditions may intervene.

Diagnosis of Slight Mastitis Infection

Although micrococci may at times cause a slight degree of inflammatory reaction in the bovine udder they are usually harmless and attention should be directed towards the quick recognition of small numbers of streptococci. Microscopic examination does not suffice as samples, which by this method show no streptococci in 100 fields, may be shown by culture to contain 2,000 mastitis streptococci per cc. The author[12] has, therefore, devised a simple cultural method which utilizes the fact that streptococci, in contrast to other udder organisms, can in his experience be recognized in deep agar culture after 12 hours incubation.

Equal quantities of end milk from each quarter are collected in a previously marked tube, 180 by 18 mm.; 0.5 cc is pipetted into a tube containing 10cc of agar, preferably containing serum and 2 per cent of dextrose, mixed and incubated at 38 deg. C. for about 12 hours. The tube is then examined. If no colonies are seen, or if only a few atypical streptococci (e. g. of the kind which produce a uniform turbidity in lactose broth, but which may appear typical on the medium of Klimmer, Haupt and Roots) the result is recorded as negative. If a few typical mastitis streptococci are found, or if many (up to 50 per cc) streptococci of any kind are found, the result is recorded as positive. In order to remove selected colonies for further test, or for microscopic examination, the agar is removed and cut up in a sterile petri dish.—Abst. from *The Veterinary Bulletin.*

[12] Steck, W. (1932). Ein einfaches Verfahren zum Nachweis geringer Galtstreptokokkeninfektionen. (Simple Method for the Recognition of Slight Infections with Mastitis Streptococci.)—*Zschr. Fleisch- u. Milchhyg.* 42. 397-398.

Anesthesia Apparatus for Cats

Having regard to the difficulties of handling small animals frequently encountered in the Small Animal Clinic at the Veterinary High School, Berlin, Professor Hinz[8] has found it expedient, especially with cats which resent strange surroundings and manipulation, to use a simple anaesthetisation box.

This is a portable metal box with one side made of glass and having a double door at one end so arranged that one portion slides within the other. The animal is put in and the doors shut down. Ether, mixed with air, is forced in near the roof through the end opposite the door, by a hand bellows. When the animal is completely narcotized it is partially pulled out, leaving its head in the box. One door, which is appropriately shaped, is then lowered on to the neck. The animal is thus kept under the anesthetic whilst the operator proceeds with the examination. If untoward symptoms are observed relief is immediately secured by pulling the animal out into the air. The author has found that by using ether containing atropin (0.002 grams per 30ccs. of ether) the excessive salivation produced by ether alone is avoided.

By this means a more rapid and complete examination can be made, which otherwise might be difficult and fraught with danger to the manipulator. The apparatus is also applicable for operative purposes.—Abst. by N. S. B. in *The Veterinary Record* 13:19:449.

Joseph Goodwin began the practice of veterinary medicine in Oxford, England, in 1798. Soon afterward he began lecturing on comparative anatomy in the Medical College of Oxford University. His lectures were soon prohibited however, by the chancellor of the University on the grounds that they were "too erudite for the collegians."

[8] Dahlbert, A. C., and J. C. Marquardt, Sterilization of Ice Cream Freezers, N. Y. Agr. Exp. Sta. Bul. No. 628—20 pages.

HEALTH EXHIBITS AT WORLD'S FAIR

Perhaps the dominating impression left by an inspection of the remarkably fine health exhibits at the Century of Progress is that scientists and particularly the medical profession know a great deal about the human body and its functions. Even a casual view of these exhibits, located in the Hall of Science, leaves in the mind of visitors a confidence that the medical profession and sanitarians know what they are about. The structure and functions of the body and its multiplicity of organs, together with factors that influence the health of the body, are shown in numerous ways with a clarity that none can mistake and with a positiveness that leaves no room for doubt.

One exhibit, for example, shows the alimentary canal in action. Here before the very eyes of the visitor is demonstrated in a mechanical action the digestive processes that take place in the mouth, the stomach, and the intestines.

Another exhibit is a mechanically vitalized human skeleton which shows how the joints and bones behave when the muscles are active during life.

A large number of exhibits can be animated by turning an electric switch or pushing a button. Some of these show how the nervous system responds to various stimuli and where the centers of response to the five senses, seeing, hearing, feeling, tasting, and smelling are located. Others show how the various organs of the body function.

The transparent man is made up of a human skeleton in which has been worked out with infinite pains and detail the circulatory system and the principal organs of the body. These are all made to appear clear and accurately by an ingenious system of lighting. This exhibit gives at a glance a workable understanding of the anatomy of man.

On the other hand there are exhibits which show with superb accuracy each step in the causes that lead to various diseases such as malaria, rabies, hay fever, poliomyelitis (infantile paralysis), cancer, tuberculosis, pneumonia, etc.

Another type of exhibit shows when and how the conquest of pain, sickness and diseases began. A miniature life-like reproduction of the first public demonstration of a surgical operation on a patient under anesthesia, for example, may be seen. This momentous event, that introduced one of the great epochs in medical service, took place, one can see at a glance, in the presence of a handful of people in a surgical amphitheatre in Boston. Other displays relate to the pioneer work of such masters as Koch, Pasteur, Lister and Ross.

Perfect models of the first hospitals are likewise to be seen, also the latest facilities for treating illness and diseases of almost every imaginable kind.

These exhibits are the best that the world has to offer. They have come from various civilized nations which have made contributions in the fields of medicine and sanitation. Probably at no previous time has been brought together in one place a more comprehensive or more interesting presentation of the resources of science that may be used in the improvment of human health.—*Illinois Health Messenger.*

BOOK REVIEW

Grundriss der klinischen Diagnostik der inneren Krankheiten der Haustiere. **(Outlines of clinical diagnostics of the internal diseases of domestic animals.)** By Prof. Dr. B. Malkmus. Eleventh edition, revised by Prof. Dr. Th. Oppermann. Hannover. 264 pages and 71 illustrations in the text, and 1 colored table. Leipzig (Germany) 1933. Dr. M. Janecke, publisher.

The importance of a correct diagnosis of a disease as the basis for rational interference with the natural course of this disease is selfevident. The layman and the quack mistake the symptom for the disease, but the trained veterinarian considers the external manifestation of a disease merely as a definite reaction to a definite cause. To teach the student the subtle art of revealing the disorders of the mechanism and the function of the animal body by clinical examination and the demonstration of changes in the condition of individual organs and in the general state of health, and of connecting the effects with the causes, is the purpose of the present volume. The third German edition (1906) of this outline had been translated into English by D. S. White and Paul Fischer (1908), but this translation is now out of print and, moreover, out of date. Veterinary science has made gigantic strides in recent years in the adaption and development of newer diagnostic methods. While a treatise in outline form was perfectly in place for the simpler requirements of former years, it is clear that the present time calls for a more elaborate work in which any meritorious newer technic should be given broader space. Likewise, greater emphasis should be placed on the diagnosis of the diseases of small domestic animals, including fur-bearing animals and birds. The edition under review conservatively clings to the horse and ox as the main subjects for discussion. The arrangement of the textmatter is the same as in the wellknown American edition. The chapter on blood diagnosis has been enlarged.—F. Volkmar.

VITAMINS

Their Uses, History, Stability, Storage and Source.

By Rachel Palmer, Gainesville, Florida.

VITAMINS	VITAMIN A	VITAMIN B_1 OR F
Uses in the Body: Results of a Deficiency	Eye disease; xerophthalmia ophthalmia, keratomalacia, conjunctivitis, night blindness; sterility, failure in ovulation; bladder stone pus sacs; loss of appetite; snuffles; labored breathing; pus in middle ear; sinus and lung infections.	Beriberi in man; disturbance of digestion and absorption; degenerative changes of heart, liver, kidneys, glands of pancreas, thyroid, and adrenals; Pneumonia in pigeons; loss of appetite, weight; nervousness, irritability, spasms, and paralytic seizures.
Positive Factors in Health	High resistance to infections; reproduction and growth normal; longevity; a high resistance to respiratory diseases.	Prevents and cures polyneuritis in pigeons and fowls. Promotes growth maintenance of appetite. Reproduction normal. Normal Lactation.
A Brief History	Osborne and Mendel 1906-13. Definitely recognized 1911. Named by Funk in 1911.	Disease. Known as early as 2,600 B. C. in China. In 1882 Japanese made dietary cure. Vitamin B is now known to contain two vitamins.
Keeping Qualities How Affected by Heat, Cold or Age	Not easily destroyed in cooking; easily destroyed by aeration and exposure to air. Can stand drying and ordinary cooking temperatures. Fat-soluble.	B_1 is water soluble and is destroyed by boiling. Juice of vegetables should be eaten. Soda causes destruction. Can stand drying.
Storage; Where and How Stored in the Body	In lungs and elsewhere in tissues of body; muscles contain little, glandular organs contain more, liver most.	The human body does not seem to have much capacity for storing vitamin B. In animals more is found in heart, kidneys, liver and brain than in muscles.
Foods Richest in Vitamins in Order of Quantity	Cod-liver oil, Milk and dairy products, Liver, Eggs, Leafy vegetables, green and yellow are much richer than white varieties, Spinach.	Cereal grains in natural state, Beans, peas, and nuts, Spinach, Cabbage, Asparagus, Yeast, Brewer's yeast best, Leaves, stems, tubers, roots, and fruits.

VITAMINS	VITAMIN B_2 OR G	VITAMIN C
Uses in the Body: Results of a Deficiency	Pellagra; retardation of growth and loss of weight; weakness and lethargy; skin lesions, hemorrhages, diarrhea with blood discharges common in last stages; black tongue; sore eyes, sore mouth, and sore nose.	Weight falls steadily; joints become tender; swelling and rheumatic pains; heart and adrenal glands enlarge; teeth loosen and take irregular positions and may decalsify. There is a reduced state of activity of all body tissues.
Positive Factors in Health	Prevents and cures pellagra in humans and blacktongue in dogs. May have preventive value in some forms of "canine hysteria" or "fright disease."	Active and alert bodies; no swellings; good teeth; growth normal; a high resistance. In the case of humans the complexion is good and clear if plenty of Vitamin C is obtained.
A Brief History	So closely associated with B_1 or F, that it has escaped notice until recently.	In 1912 Holst and Frolich searched for the cause of scurvy. In 1535 Cartier's men had been relieved by eating bark. Has been isolated just recently in 1932.
Keeping Qualities: How Affected by Heat, Cold or Age	Heat stable. Water soluble.	Very easily destroyed by heat and by oxidation. Twice cooked foods lack the C vitamin. Aging and drying causes loss.

VITAMINS—Continued

VITAMINS	VITAMIN B_2 OR G	VITAMIN C
Storage; Where and How Stored in the Body.	Body has limited ability to store vitamin G therefore a constant supply is needed at all times.	Vitamin C is stored in the liver of the rat to a considerable extent, but the storage in the human is very limited.
Foods Richest in Vitamins in Order of Quantity.	Cow's milk, Yeast, Green leafy vegetables, Bananas, Spinach.	Sprouted cereal grains, Citrus fruits, Tomatoes, (cooked, raw, or canned), Turnips, Cabbage.

VITAMINS	VITAMIN D	VITAMIN E
Uses in the Body: Results of a Deficiency.	Rickets; bones deficient in calcium; restlessness; irritability; listlessness; constipation; lack of resistance to other diseases; delayed teething; TB in rats; causes a mineral disturbance throughout the system.	Sterility, failure of placental function with death and resorption of the developing young.
Positive Factors in Health	Promotes assimilation of calcium and phosphorous and thus proper development of bones and teeth; Aids general development and growth.	Makes possible full period gestation in animal but it has not yet been found if needed by humans too.
A Brief History.	In 1913 Steenbock discovered that a goat used lime that was in his diet when green grass was added. In 1921 Cod-liver oil used. Irradiation 1924.	In September, 1923, Vitamin E was discovered and called X by Evans and Bishop.
Keeping Qualities. How Effected by Heat, Cold, or Age.	Fat-soluble. Withstands aging. Not readily destroyed by heat.	Belongs to Fat-soluble group. Not readily destroyed by heat, its stability is remarkable as it is not affected by superheated steam, daylight, acid, or alkali. Can be concentrated in wheat oil.
Storage; Where and How Stored in the Body.	Stored in the cholesterol and ergosterol of the skin. Too much of the chemical compound can be given, causes arteriosclerosis.	The body is able to store vitamin E to a considerable extent. Rats can store it for three or four months. Mothers can transfer Vitamin E to young.
Foods Richest in Vitamins in Order	Cod liver oil, Egg yolk, Liver, Milk products (small amounts), Irradiated foods, Yeast.	Oil of wheat, Vegetable oils but not in cod-liver oil, Fresh lettuce, Milk and butter fat, Spinach, Alfalfa, Water cress.

MILK-BORNE EPIDEMICS DISAPPEARING EXCEPT IN BACKWARD COMMUNITIES

Twenty-five years ago, milk-borne epidemics were so common that two departments of the Federal government collaborated in writing a book of nearly a thousand pages recording them. Now milk-borne disease is so rare that the National Association of Milk Inspectors was able to report but 21 outbreaks and 217 cases of typhoid; one epidemic of 20 cases of paratyphoid; one epidemic of 22 cases of diphtheria; two epidemics including 78 cases of diarrhea; one epidemic of five cases of scarlet fever; six epidemics including 880 cases of septic sore throat; one epidemic of infantile paralysis; and 1545 cases of undulant fever in 1931.

Twenty of the 21 epidemics of typhoid fever were due to raw milk. The epidemic of paratyphoid, the one of diphtheria, the one of infantile paralysis, both epidemics of diarrhea, five of the six epidemics of septic sore throat and the undulant fever cases also were due to raw milk.

Thus, pasteurized milk comprising 80 percent of the fluid milk used in cities, was responsible for only two of the 32 epidemics and none of the cases of undulant fever.

WACKER DRIVE—CHICAGO

Veterinarians attending the seventieth annual meeting of the A. V. M. A. in Chicago next August will want to see this famous two-level driveway on the south shore of the Chicago River. It is just five blocks north from the Palmer House, the headquarters of the convention. The view shown is looking east from the balcony of the Merchandise Mart, the largest building in the world. It shows the Chicago River which used to flow east into Lake Michigan but now flows west out of the lake to finally reach the Mississippi River and Gulf of Mexico. The bridges shown are, beginning in the foreground: Wells Street, LaSalle Street, Clark Street, Dearborn Street, State Street (open) and the south abutment of the Wabash Avenue bridge. The street running through the center is the upper level of Wacker Drive; directly below it is the lower level (formerly South Water Street, the great central produce market), on which and out through its subterranean connections move thousands of tons of freight daily. Wacker Drive is a very busy street. Moving traffic does not show in the photograph because it was a time exposure; the Drive bears to the left at Wabash Avenue to end in Michigan Avenue in front of the building marked "1." From no other view in this or any other city may one see so much concrete evidence of "A Century of Progress." Contrast this scene with its condition a hundred years ago—at that time a sluggish stream flowing through a wild marsh, Old Fort Dearborn on the site adjoining Mather Tower (No. 2), the only building, for a striking reason for celebrating "A Century of Progress" at the World's Fair.

The numbered buildings shown in the illustration are: (1) 333 Building. (2) Mather Tower (75 East Wacker Drive. The office of VETERINARY MEDICINE is located in this building). (3) Bell Building, with the Chicago Motor Club Building shown just in front of it. (4) The Carbon and Carbide Building. (5) Pure Oil Building. (6) LaSalle-Wacker Building. (7) Builders' Building. The top of the tower of the Pittsfield Building shows just above it. The Pittsfield Building is on Wabash Avenue near convention headquarters. (8) Engineers' Building. The tower of the Trustees' Building shows above it and just to the right, the top of the spire on the Temple Building. (9) Morrison Hotel. (10). Steuben Club.

Just to the left of the 333 Building, but not shown in the illustration, stands the Tribune Tower, the Wrigley Building and the Medinah Temple. All of the taller buildings shown are upwards of 40 stories high. To reach Wacker Drive from the A. V. M. A. convention headquarters, leave the hotel by the Wabash (east) exit and turn left (north) on Wabash Avenue and follow to the river (five blocks). Wabash Avenue runs between buildings 4 and 5. When you reach the river the office of VETERINARY MEDICINE is one-half block to the right. The latch string is out; you are invited to call.

RESERVE ROOM ACCOMMODATIONS IN ADVANCE

The local committee on arrangements for the A. V. M. A. meeting to be held in Chicago August 14-18 invite the attention of those contemplating attendance at the meeting to the fact that hundreds of thousands of visitors to the World's Fair will be in the city at that time and while there is hotel accommodations for all, the better hotels will be filled to capacity. The Palmer House, headquarters of the A. V. M. A. convention, guarantees to furnish rooms for all who attend the convention *provided reservations are received by August 1st.*